

In This Issue—Another Flat Rate Story

MOTOR AGE

Vol. XLIV
Number 2

PUBLISHED WEEKLY AT THE MALLERS BUILDING
CHICAGO, JULY 12, 1923

Thirty-five Cents a Copy
Three Dollars a Year



J. C. HARVEY says:

"I have always made money selling the

HAYNES

I have been a Haynes Distributor continuously for over ten years, during which time I have always made money. Throughout this time I have sold the line on a basis of quality, its wonderful performance and extreme long life and durability. As proof of this, I can cite the fact that the first Model 23 [your first six cylinder,] the first Model 24 and the first Model 30 [the first light six] which I sold are still giving satisfactory service to their original owners."

J. C. HARVEY, Haynes Distributor, Boston, Mass.

Profit by the new Haynes "Volume Value" Plan

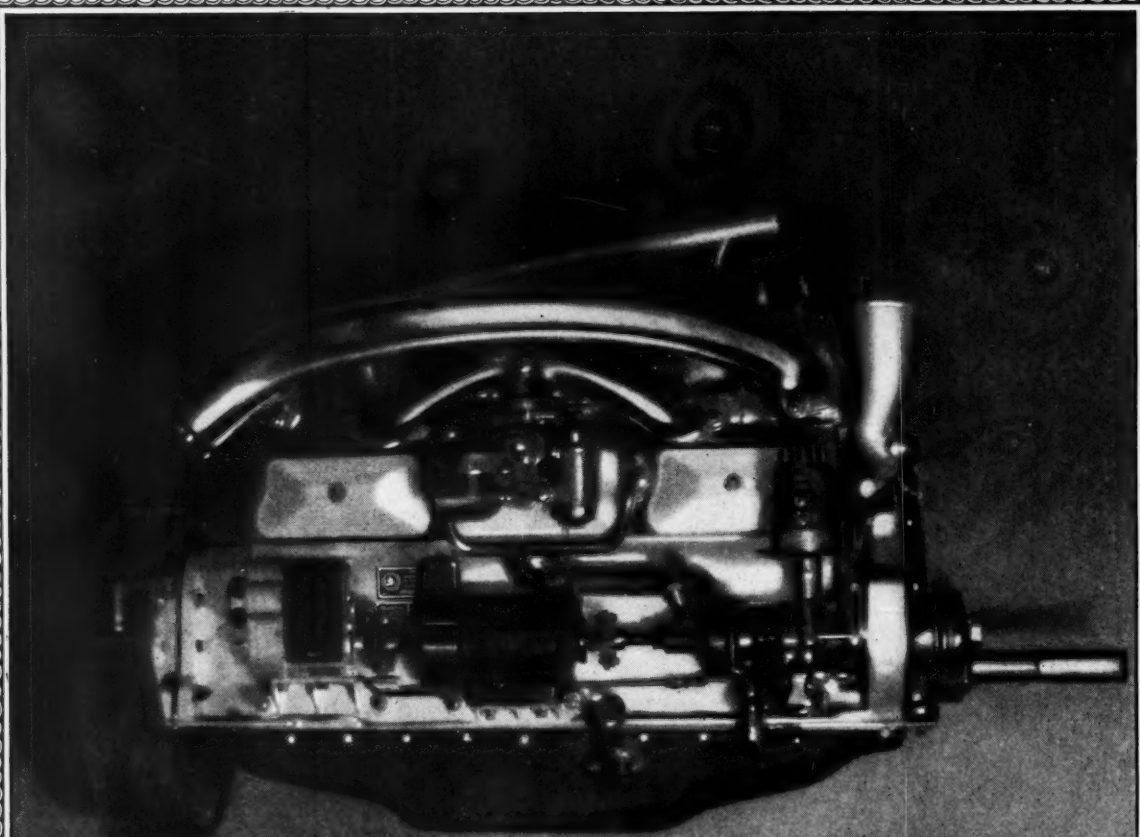
Dealers will have a greater opportunity than ever under the new Haynes selling policy. Investigate this plan. Ask us about rich open territory. Write, wire or telephone. In writing or wiring address Department 753.

THE HAYNES AUTOMOBILE COMPANY, Kokomo, Indiana

EXPORT OFFICE: 342 Madison Avenue, New York City, U. S. A.



The New Haynes 60 Standard Touring Car
5 Passengers



*The New Series Model 6T—
a passenger car motor. Just
one of the many Continentals
built to fill every passenger
car requirement.*

IN THE Red Seal Continental Motor the buyer of a specialized car or truck finds every appearance and reality of quality that the wisest purchase consideration can demand. The acknowledged sign of supreme motor achievement is and always will be—the Continental Red Seal.

Built by the largest motor Specialists in the world

CONTINENTAL MOTORS CORPORATION

Detroit and Muskegon, Michigan



Another RECORD broken



3,000,264 *QUALITY*

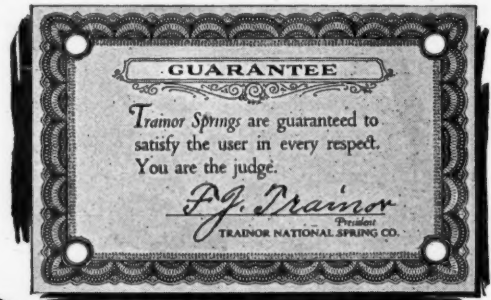
Piston Rings were actually manufactured to our customers' rigid specifications during May, 1923—the biggest month in our history.

Backed by liberal factory policies, the *Right Ring* at the *Right Time* at the *Right Price* created this enormous demand.

The Piston
RING COMPANY
Muskegon, Michigan



Definite Guarantee For Your Protection



Bronze Bushings For Longer Wear

THE longer wearing bronze bushings used in Trainor Springs are visible evidence of the quality exemplified by the Trainor Guarantee.

Even though the original equipment is steel bushed, Trainor uses bronze bushings in all passenger car springs except those for Fords. And this is but one Trainor advantage.

Heat-treated and oil-tempered, *for greater durability*—plainly marked, *for your convenience*—and backed by an unqualified guarantee of satisfaction, *for your protection*—these are other reasons why the jobber or dealer who sells Trainor Springs has the jump on competition.

TRAINOR NATIONAL SPRING CO., NEW CASTLE, IND.



Plainly Marked For Your Convenience

THE make and model of the car, the position (front or rear) and the catalog number are all plainly marked on every Trainor Spring as shown above. This is a convenience that simplifies your stock-keeping. It also permits Trainor Springs to be put into any stock without confusion.

Jobbers: If you are interested in building a permanent and profitable spring business, write for details of "The Trainor Way"—the most modern and practical means of handling replacement springs.

Dealers: Write for the name of the nearest jobber selling the bronzed bushed, plainly marked and guaranteed Trainor Springs.

MOTOR AGE

Reg. U. S. Pat. Off.

Published Every Thursday by

THE CLASS JOURNAL COMPANY

MALLERS BUILDING
59 East Madison Street, CHICAGO

Vol. XLIV

Chicago, July 12, 1923

No. 2

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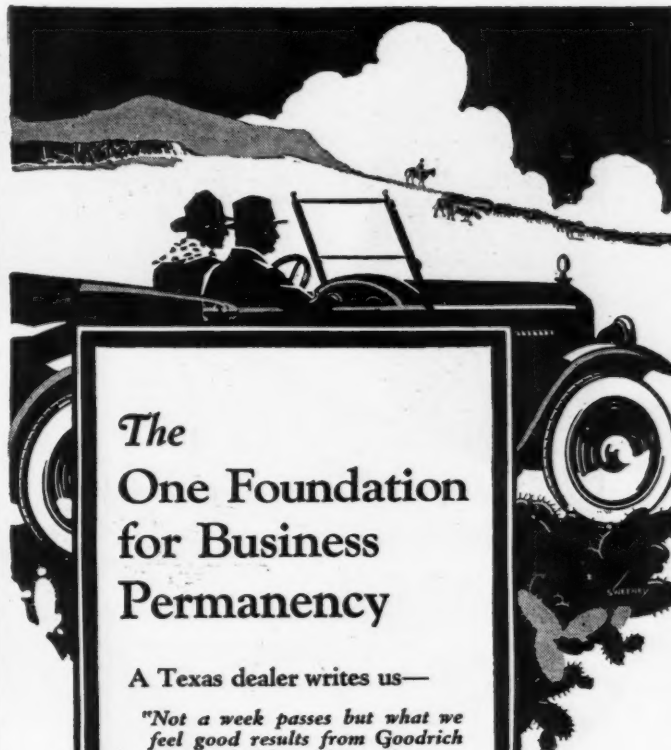
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SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....	\$ 3.00 per year
Canada	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies .....	.35 cents

Subscriptions accepted only from the Automotive Trade

Entered as Second Class Matter Sept. 19, 1899, at the Post Office at Chicago, Ill., under Act of March 6, 1879.



The One Foundation for Business Permanency

A Texas dealer writes us—

"Not a week passes but what we feel good results from Goodrich National Advertising. In some instances we can actually trace the influence on sales as customers specifically mention it, but the real important part it plays all the time is that it breaks down sales resistance."

W. H. Harrison,
Ft. Worth Auto Supply Co.,
Ft. Worth, Tex.

Goodrich advertising and dealer co-operation undoubtedly secure a large amount of new business for Goodrich dealers, but a bigger factor still holds it—dependable quality.

Goodrich reputation rests on the one fact that quality is always maintained at the highest peak—just what is expected of an organization of over half a century experience in rubber goods manufacture.

Dealers, like other people, are known by the company they keep. Many a flourishing tire business today has been built upon the solid rock of the public's confidence in Goodrich.

THE B. F. GOODRICH RUBBER CO.
Established 1870

Goodrich TIRES

"Best in the Long Run"



Just peel 'em off~

When you use Laminated Shims, you PEEL. You PEEL off hours of time: lots of labor and money in the way of substantial profits. All you have to do is PEEL the shim and the job is done. Better bearing adjustments with half the trouble. Don't fuss and cuss. Use Laminated and smile!

The Car Dealers' Kit

An all-steel box containing 250 shims for all models of popular makes of cars. Just what is needed in the Service Dep't. Each shim ready for instant use.



The Service Kit

An all-steel box containing a complete assortment of 250 shims for all makes of cars. Just take 'em from the kit and peel 'em down to fit.

Send for Sample Shim

Address "Sales Dept."

LAMINATED SHIM COMPANY, Inc., 14th St., and Governor Pl., LONG ISLAND CITY, N. Y.

St. Louis: Mazura Mfg. Co.

LAMINUM

A Message For Retail Salesmen

During the first six months of this year, twenty-five retail salesmen, located in almost as many cities, delivered a total of more than \$3,000,000 worth of Studebaker cars.

That's an average of \$120,000 per man—\$20,000 a month—or at the rate of a quarter of a million dollars per man per year.

This gives an insight into the wonderful possibilities open to salesmen who sell Studebaker cars. Any retail salesman anywhere who is ambitious to succeed and who will work consistently along well defined lines can make a success selling Studebaker cars.

The sales resistance which has to be overcome by salesmen for cars of lesser popularity is not experienced by Studebaker salesmen because of the confidence and respect enjoyed by Studebaker cars and the good will resulting from their records in the use of owners. The prospect for a Studebaker is half sold in advance.

Then, too, every quality-car prospect is a Studebaker prospect because Studebaker builds a complete line of three models of Sixes in twelve body types from which the buyer can be suited with the exact car wanted in the right style and at the right price.

If you find it rough sledding with the line you now sell, get in touch with the local Studebaker dealer. He may offer you an opportunity. If he does, it's worth taking.

MODELS AND PRICES—f. o. b. factory		
LIGHT-SIX 5-Pass., 112" W. B., 40 H. P.	SPECIAL-SIX 5-Pass., 119" W. B., 50 H. P.	BIG-SIX 7-Pass., 126" W. B., 60 H. P.
Touring.....\$995	Touring.....\$1350	Touring.....\$1750
Roadster (3-Pass.).....975	Roadster (2-Pass.).....1325	Speedster (5-Pass.).....1835
Coupe-Roadster (2-Pass.) 1225	Coupe (5-Pass.).....1975	Coupe (5-Pass.).....2550
Sedan.....1550	Sedan.....2050	Sedan.....2750

THE STUDEBAKER CORPORATION OF AMERICA
South Bend, Indiana

STUDEBAKER



T H I S I S A S T U D E B A K E R Y E A R

Nash Leads the World in Motor Car Value

Hatboro, Pa., Tells Its Story of Nash Sales

The population figures of Hatboro, Pennsylvania, show only 1102 people resident there.

But J. L. Krewson, who holds the Nash contract in Hatboro, has retailed 66 new Nash cars during the period from September 1st, 1922 to May 31st this year.

That is emphatic testimony to the high regard buyers have for the Nash.

And it is equally downright evidence as to the value of a Nash dealer contract.

There's no denying the fact that the Nash line offers one of the few big opportunities in the trade to build up a growing business and make real profits.

And yet today there's many a good dealer struggling along trying to keep his books free from red ink who could make a showing like Krewson if he had the Nash group of Fours and Sixes to sell.

Now is the time to change. Wire us without delay about a contract.

NASH

THE NASH MOTORS COMPANY
KENOSHA, WISCONSIN

Nash Leads the World in Motor Car Value

(1745)

At Dallas—"4300 lbs. of gravel, eleven trips a day."

At Waterloo—"4200 lbs. of concrete, 22 hours daily."

At Kingston—"4 tons of clay from pit to brickyard."

At Minneapolis—"7488 lbs. of lumber in soft, grassy ground."

The Warford-equipped Ford Truck is everywhere proving equal to costliest trucks, in everything but price.

Unsurpassed Ford strength and light weight are scientifically applied to heaviest loads, through Warford selective, full Timken-equipped transmission.

Six speeds forward give brute pulling power on hills; 30 to 40 miles an hour on pavements; peak economy for the empty return run.

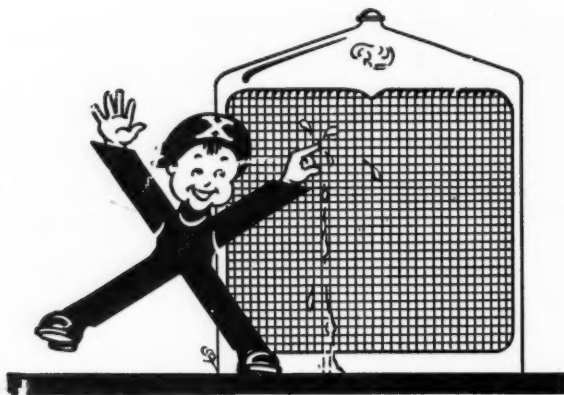
Warford enables Ford to do double, triple duty, with long life and lowest cost. Easy installation.

**Ford dealers now sell ALL truck users.
Write for money-making sales contract.**

The Warford Corporation, 44 Whitehall St., New York City

Warford
AUXILIARY TRANSMISSION





“X” Liquid Repairs Leaks

In Radiators and Bank Accounts

REPAIR MEN use “X” liquid to give their customers a quick satisfactory job. “X” repairs the leaks.

Car Dealers put “X” Liquid in the radiator of every new car sold. It assures a smooth running car free from leaks and overheating. “X” prevents leaks and removes scale.

Shrewd Retailers suggest “X” to every customer. Every one needs it. They usually buy it and at no extra selling cost you make “X”tra profits.

*Used by U. S. Government, Standard Oil, Gen. Electric, American
Tel. & Tel., etc., who test scientifically before adopting.
Over 3 million cans sold yearly.*

X Laboratories, 25 W. 45th Street, New York

Factories: Boston and Montreal

“X” Liquid

The Original Radiator Liquid

MOTOR AGE



How the Flat Rate Makes for the Dealer's Profit

*It Is Based on Proper Accounting and Eliminates the Waste,
Consequently the Speculation*

By PAUL DUMAS

THE Flat Rate schedules printed in connection with this installment cover an operation that is very frequently executed in every size establishment. The reader will notice that "tuning engine" is included in the valve grinding operation and that the Maxwell operation is taken as the basis for operation sequence. Tuning the engine should be a part of every valve grinding job mainly because it allows the grinding operation to show to advantage.

If a particle of dirt should decide to locate in the

carburetor screen or on the interrupter points just after the valves have been ground, the owner is wont to blame the whole occurrence on the valve grinding job. Tuning the engine at the time the valves are ground includes cleaning points, plugs, etc., and forestalls any complaints that would otherwise arise if these points were neglected. The Maxwell operation has been chosen solely for the sake of convenience and the fact that it is representative of the average small four cylinder car.

THESE SCHEDULES ARE VALUABLE AS REF-

ERENCE GUIDES IN MAINTENANCE MERCHANDISING BUT THEY ARE PICTURES IN AN ILLUSTRATED BOOK OF INSTRUCTIONS. You cannot profitably apply the schedules unless you have read the instructions which in this case consist of a thorough knowledge of "how much it is costing you." The fallacy of selling your merchandise without a knowledge of its cost price is an almost universal ailment. What will be printed in connection with future schedules is intended as the background of instructions which make the schedules possible of realization.

There has always been a certain class of men within and without who have looked on the automobile industry as a highly speculative proposition. When we say "speculative" it should be considered in its broadest sense.

The men outside the business (a certain class of car owners) who belong to the class mentioned, are always highly speculative regarding the moral and business qualifications of the motor vehicle merchant. If you would interview this class of individual, you would find him expressing the opinion that merchants in the business either become millionaires or go broke after a few years activity.

After you have talked to the outsider, go to the merchant engaged in selling or maintaining motor vehicles who wants to sell out. Nine times out of ten, if you can get under his skin, you will hear a long tale about "a lot of hard work," "lucky years" and finally "there's no money in the business because cars are getting too common and owners are wiser."

All of which is nothing more or less than "hokum," but goes to show that we still have with us those who think that all successful automobile merchants are J. Rufus Wallingford and all car owners fools or parasites. Both the man within and the man without are mild radicals and their version of conditions is as well founded as the soap box orators version of the man with money.

If former Vice-President Marshall was right when he said "What this country needs is a good five cent cigar," we would like to say that, "What the automobile business needs is a good cost accountant." **THERE IS NOTHING WRONG WITH THE BUSINESS BUT WE DO NEED MORE MERCHANTS WHO ARE GOOD BUSINESS MEN.** Men who can operate their establishments along the same lines that have been proven correct in merchandising other necessities.

The previous installment of this series listed the 18 items that constitute overhead and as overhead and the cost of doing business is the beginning of all BOOKKEEPING, considerably more can be said about it than was previously printed.

Before going further it may be advisable to get back to the primary principles of this business of selling, equipping and maintaining motor vehicles. The merchant who deals in SELLING, EQUIPPING AND MAINTAINING is in reality operating a TRANSPORTATION DEPARTMENT STORE.

Car Sales are the basis of all revenue

in the business and are the ground on which are planted the trees of ACCESSORIES, STORAGE, and MAINTENANCE, which ARE THE MERCHANDISE CARRIED AS STOCK IN THE TRANSPORTATION STORE. Every establishment in the business, regardless of its size, deals in one or more of these stock items.

The first question to be settled by the business man entering this field, is to determine on which or how many of the items he will concentrate his selling efforts. Every locality and every size of purse has its own particular conditions which must be considered carefully before taking action. An exclusive accessory store located on a well traveled country road five miles from the nearest town would not be a profitable investment, neither would an exclusive storage garage or a car sales room.

Business men in the industry have made money selling any one of the five items of stock and many have made money in a TRANSPORTATION DEPARTMENT STORE. In every case however a careful study was made of the business possibilities of the territory with special reference to which item to stock most heavily.

This article has to do with maintenance so let us consider some of the things that will justify the statement that the automobile business needs a good accountant or bookkeeper.

Maintenance will pay a reasonable profit to the man who will manage his maintenance activities with the same de-

gree of efficiency that any other merchandise demands. Money has been lost in maintenance shops and many shops are just about breaking even because the management has only a hazy idea of COSTS.

An example that may serve to prove that the income from labor sold on an hourly basis is not necessarily a source of profit is shown in the tabulations below which represents figures that will hold true for the case in hand. The purpose of the table is to show that something better than an arbitrary price of labor at so much per hour is needed in the small, exclusive maintenance establishment.

The manager and owner of a small repair shop has two mechanics working for him. He has no storage space and does not carry a stock of accessories. There is room for five cars in the building which has a fair equipment of tools, including machinery. A shop of this size represents an average investment of at least \$5,000. Under the most favorable conditions each mechanic will produce 2,400 hours of labor per year, of 300 working days. (Remember we are considering labor on the old hourly basis). The total time of the two mechanics we will say is 4,800 hours, which is closer to the ideal than the practical. The overhead items are numbered according to the list published in the first installment of this series. The labor charge to the customer is assumed as \$1.25.

4,800 hrs. @ \$1.25=\$6,000 gross labor income.

WHAT IT COST TO SELL \$6,000 WORTH OF LABOR

NO CHARGE SERVICE.....	Item No. 1.	Will average 1 per cent of gross income.....	\$ 60.00
SHOP SUPPLIES.....	No. 2.	Will average at least 1 per cent.....	60.00
REPAIRS TO BUILDINGS, ETC.....	No. 3.	Will average.....	25.00
POWER, LIGHT, HEAT AND WATER.....	No. 4.	Will average 2.5 per cent.....	150.00
MISCELLANEOUS EXPENSE.....	No. 5.	Will average 4 per cent.....	240.00
RENT.....	No. 6.	Will average 2.5 per cent.....	150.00
STATIONERY AND OFFICE SUPPLIES.....	No. 7.	Will average .3 per cent.....	18.00
TELEPHONE, POSTAGE, ETC.....	No. 8.	Will average .5 per cent.....	30.00
SHOP LABOR.....	No. 12.	4,800 hrs. @ .60 per hour.....	2,880.00
INSURANCE AND TAXES.....	No. 16.	Will average .7 per cent.....	42.00
DEPRECIATION.....	No. 17.	Will average 10 per cent on \$2,000 worth of equipment.....	200.00
DOUBTFUL ACCOUNTS.....	No. 18.	Will average 1 per cent.....	60.00
			\$3,915.00

The business of selling, equipping and maintaining motor vehicles is something more than hiring good mechanics. It is a business where the relation between work done by a machine and work done by hand must be properly coordinated, and like the makers of a well known cash register have said in their advertising "The man who keeps his business in his head cannot expect to keep ahead in his business."

The subject of costs which we have gone over briefly in this installment is a vital factor and what we have said here does not fully cover the subject. Future installments will deal with other points of management that have a direct bearing on OVERHEAD and it is suggested that the reader refer back to this and the previous installment in order to link together the points covered.

If \$5,000 were put in the bank on interest at 4 per cent, it would bring \$200 which should be added to the cost of selling which would bring the total cost up to \$4,115. SUBTRACTED FROM \$6,000, THE COST OF DOING BUSINESS LEAVES A NET PROFIT OF \$1,885 FOR THE YEAR, or a weekly salary of \$36.44 FOR THE PROPRIETOR, IN EXCHANGE FOR HIS SERVICES AS SUPERVISOR, GENERAL MANAGER, AND BOOKKEEPER.

If the hour rate is increased to \$1.35 per hour, the weekly salary of the proprietor goes up to \$47.78 which means that he is just breaking even. THE MORAL IN THIS INSTANCE IS TO KNOW YOUR COSTS AND ABOVE ALL TO CHARGE YOUR SALARY AGAINST THE BUSINESS. DIVIDEND PAYING PROFITS DO NOT START UNTIL AFTER EXECUTIVE AND MANAGERIAL SALARIES HAVE BEEN DEDUCTED.

(Continued on page 13)

Flat Rate Operation Schedules, Engine Section—Valves, Guides and Tappets

Operations No. 3 to 5 inclusive covering frequently executed operations on 4, 6, and 8 cylinder engines with solid and detachable heads. Unless otherwise specified, labor is assumed at \$1.35 per hour. Parts are included on those cars where the "Total Charge" is listed.

MAXWELL—After Car No. 193891				
Operation No. 3	Description of Job	Parts Prices	Max. Time	Labor Charges Total Charge
No. 3-HO	GRIND VALVES, including removal and installation of cylinder head, remove carbon, adjust tappets and tune engine.		5 hrs.	\$6.75
No. 3-VGA	GRIND VALVES, remove carbon, adjust tappets and tune engine WHEN HEAD HAS BEEN REMOVED FOR SOME OTHER OPERATION. VALVE GUIDES ALL IN CONJUNCTION with Operation No. 3, or 3-HO.		3 3/4 hrs.	5.07
No. 3-VGI	8 valve guides @ \$.20..... REMOVE AND INSTALL ONE VALVE GUIDE in conjunction with Operations No. 3, 3-HO, and 4.....	\$1.60 .20	4 hrs. 1 1/4 hr.	5.40 .34
No. 4	REMOVE AND INSTALL ONE VALVE GUIDE, including removal and installation of cylinder head and valves, clean carbon.....	.20	1 1/2 hr.	2.03
RECOMMEND OPERATION NO. 3-HO IN CONJUNCTION WITH ABOVE				
				2.23

OPERATION NO. 3 IS PERFORMED AS FOLLOWS:

1. Drain radiator and remove cylinder head.
2. Remove valve cover plate and loosen valve lifter tappet screw lock nuts.
3. Turn tappets down about two turns to give clearance when grinding.
4. Remove and grind eight valves.
5. Reassemble in opposite order of disassembly and set tappets to .004.
6. TUNE ENGINE CONSISTS OF:
7. Clean and adjust carburetor.
8. Clean and adjust distributor and points.
9. Check timing.
10. Drain and clean vacuum tank.
11. Clean spark plugs.

*Use Maxwell timing indicator.

DODGE—All Models.				
Operation No. 3	Description of Job	Parts Prices	Max. Time	Labor Charges Total Charge
No. 3	SAME AS MAXWELL.		6 hrs.	\$8.10
No. 3-HO	Description of Job		5 hrs.	6.75
No. 3-VGA	SAME AS MAXWELL.		4 hrs.	5.40
No. 4	8 valve guides..... Description of Job		2 hrs.	2.70
	SAME AS MAXWELL.			
	1 valve guide..... OPERATION NO. 3 IS PERFORMED SAME AS MAXWELL.			
DODGE—4 Cylinder Models				
Operation No. 3	Description of Job	Parts Prices	Max. Time	Labor Charges Total Charge
No. 3	Same as Maxwell.		6 1/2 hrs.	\$8.78
No. 3-HO	Same as Maxwell.		4 1/2 hrs.	6.08
OPERATIONS NOS. 3 and 3-HO	TO BE PERFORMED SAME AS MAXWELL.			

HUDSON—Super-Six Models.				
Operation No. 3	Description of Job	Parts Prices	Max. Time	Labor Charges Total Charge
No. 3	SAME AS MAXWELL plus REMOVE CARBURETOR FROM BLOCK, CLEAN AND POLISH THOROUGHLY, TAKE PLAY OUT OF ROCKER ARMS, IF ONE OR MORE TAPPET SCREWS NEED CHANGING DO SO ON THIS OPERATION.		8 hrs.	\$10.80
No. 3-VGA	Description of Job		3 hrs.	4.05
No. 5	SAME AS MAXWELL. MATERIAL 12 valve guides..... OVERHAUL AND QUIET TAPPETS includes: Remove tappets, turn down guides, fit new tappets and screws if necessary, remove push rods, rocker arms, and do anything that may help to eliminate noise.		9 1/4 hrs.	12.49
OPERATION NO. 3 TO BE PERFORMED SAME AS MAXWELL PLUS ITEMS LISTED IN DESCRIPTION OF JOB.				

ESSEX—All Models.

Operation No. 3	Description of Job	Parts Prices	Max. Time	Labor Charges Total Charge
No. 3	SAME AS HUDSON.		7 hrs.	\$ 9.45
No. 3-VGA	Description of Job		2 hrs.	2.70
No. 5	8 valve guides..... SAME AS HUDSON. Use Essex special tappet wrenches Nos. S. T. 500, 501 and 502.		9 1/4 hrs.	12.49
OPERATION NO. 3 TO BE PERFORMED SAME AS HUDSON.				

PAIGE—6-66 2nd and 3rd Series.

Operation No. 3	Description of Job	Parts Prices	Max. Time	Labor Charges Total Charge
No. 3	SAME AS MAXWELL.		6 hrs.	\$8.10
No. 3-HO	Description of Job		4 3/4 hrs.	6.42
No. 3-VGA	SAME AS MAXWELL, plus removing carburetor.		6 1/2 hrs.	8.78
No. 4	12 valve guides..... Description of Job		1 1/2 hr.	\$0.68
No. 5	1 valve guide..... Description of Job		2 1/4 hrs.	3.04
OPERATION NOS. 3 and 3-HO TO BE PERFORMED SAME AS MAXWELL EXCEPT THAT IT IS NECESSARY TO REMOVE CARBURETOR.				

JEWETT—6-50 1st Series.

Operation	Description of Job	Parts	Max.	Labor	Total
No. 3	SAME AS MAXWELL.	Prices	Time	Charges	Charge
Operation	Description of Job				
No. 3-HO	SAME AS MAXWELL.		7 1/2 hrs.	\$10.13	
	OPERATION NO. 3 PERFORMED SAME AS MAXWELL.		6 hrs.	8.10	

MARMON—34B Series.

Operation	Description of Job	Parts	Max.	Labor	Total
No. 3	SAME AS MAXWELL.	Prices	Time	Charges	Charge
Operation	Description of Job				
No. 3	SAME AS MAXWELL.				
	MATERIAL				
	1 cylinder head gasket, included in total.		8 hrs.		\$18.50
Item	OPERATION NO. 3 IS PERFORMED AS FOLLOWS:				
	1. Remove cylinder head cover and disconnect inlet heater from inlet manifold.				
	2. Disconnect exhaust manifold from exhaust pipe.				
	3. Disconnect the radiator inlet pipe at the engine.				
	4. Remove the fan assembly.				
	5. Remove the rocker arms and long push rods.				
	6. Remove cylinder head nuts and lock washers and lift off head.				
	7. Lay head on bench and remove valves.				
	8. Grind and reassemble in opposite order of disassembly.				

PACKARD—Models 126-123, 116.

Operation	Description of Job	Parts	Max.	Labor	Total
No. 3	SAME AS MAXWELL.	Prices	Time	Charges	Charge
Operation	Description of Job				
No. 3	SAME AS MAXWELL.				
	MATERIAL				
	1 No. 11406 Cyl. head gasket.				
	1 No. 114312 Water pump gasket.				
	1 No. 116722 Fuelizer screen.				
	Included in total.		8 hrs.	\$10.80	\$13.45
Models	MATERIAL				
	1 No. 120350 Cyl. head gasket.				
	1 No. 116722 Fuelizer screen.				
	1 No. 117853 Gasket.				
	Included in total.		7 1/4 hrs.	9.79	12.20

OPERATION NO. 3 IS PERFORMED AS FOLLOWS: ON THE MODEL 116

1. Drain water from cooling system.
2. Remove head lamps assembly, Delco head and wiring assembly. Before removing Delco head, turn engine to number one cylinder firing center, lift off Delco head without disturbing position of drive shaft, mark drive shaft so it can be re-assembled in its original position.
3. Loosen radiator and remove cylinder head.
4. Scrape carbon (clean relief cocks).
5. Remove valves and springs and polish valves.
6. Face off valves if pitted too deeply. Stems must be straight and true before facing.
7. Re-seat valve seats if pitted too deeply.
8. Grind all valves and reassemble valves in cylinder and set tappets standard.
9. Replace head using new gasket if necessary.
10. Reassemble wiring, Delco head. (To reassemble engine must again be turned to number one firing center, drive shaft replaced in accordance with mark and head replaced with rotor on number one segment.)
11. Clean and adjust Delco points and spark plugs.
12. Clean and adjust carburetor and fuelizer and install new fuelizer screen.
13. Adjust fan belt and timing chain.

SAME AS FOR 116 EXCEPT that headlight assembly is not removed.

HUPMOBILE—Model R and Later.

Operation	Description of Job	Parts	Max.	Labor	Total
No. 3	SAME AS MAXWELL.	Prices	Time	Charges	Charge
Operation	Description of Job				
No. 3	SAME AS MAXWELL except that no work is done on the fuel system.		7 hrs.	\$9.45	
Operation	Description of Job				
No. 3-HO	SAME AS MAXWELL.		5 hrs.	6.75	
	OPERATION NO. 3 PERFORMED SAME AS MAXWELL.				

OAKLAND—Models 34 B, C and D

Operation	Description of Job	Parts	Max.	Labor	Total
No. 3	SAME AS MAXWELL.	Prices	Time	Charges	Charge
Operation	Description of Job				
No. 3	SAME AS MAXWELL.		5 1/2 hrs.	\$7.43	
	OPERATION NO. 3 IS PERFORMED AS FOLLOWS:				
	1. Drain radiator remove hood and cylinder head cover.				
	2. Remove cylinder head water outlet cap screws.				
	3. Remove front and rear rocker arm bracket and shaft assemblies.				
	4. Remove exhaust pipe to manifold screw and carburetor heat elbow.				
	5. Disconnect vacuum tank to inlet manifold pipe assembly and remove carburetor hot air stove.				
	6. Disconnect carburetor from inlet manifold.				
	7. Remove 10 cylinder head cap screws and lift cyl. head off.				
	8. Remove 12 "U" washers, valve spring cups, and valve springs and cotter pins.				
	9. Clean carbon from valves and cylinder head and grind all valves.				
	10. Assemble in opposite order of disassembly after grinding is completed.				
	11. Clean spark plugs, interrupter points and carburetor strainer.				
	12. Start engine and allow to warm up after which set tappets to .010.				

OPERATION NO. 3 IS PERFORMED AS FOLLOWS:

1. Drain radiator remove hood and cylinder head cover.
2. Remove cylinder head water outlet cap screws.
3. Remove front and rear rocker arm bracket and shaft assemblies.
4. Remove exhaust pipe to manifold screw and carburetor heat elbow.
5. Disconnect vacuum tank to inlet manifold pipe assembly and remove carburetor hot air stove.
6. Disconnect carburetor from inlet manifold.
7. Remove 10 cylinder head cap screws and lift cyl. head off.
8. Remove 12 "U" washers, valve spring cups, and valve springs and cotter pins.
9. Clean carbon from valves and cylinder head and grind all valves.
10. Assemble in opposite order of disassembly after grinding is completed.
11. Clean spark plugs, interrupter points and carburetor strainer.
12. Start engine and allow to warm up after which set tappets to .010.

CHEVROLET—Models 490 and FB.

Operation	Description of Job	Parts	Max.	Labor	Total
No. 3	SAME AS MAXWELL.	Prices	Time	Charges	Charge
Operation	Description of Job				
No. 3	SAME AS MAXWELL.		5 hrs.	\$6.75	
	OPERATION NO. 3 TO BE PERFORMED SAME AS OAKLAND.				
	Set intake tappets to .004 and exhaust to .006.				

STUDEBAKER—Six Cyl. Models.

Operation	Description of Job	Parts	Max.	Labor	Total
No. 3	SAME AS MAXWELL.	Prices	Time	Charges	Charge
Operation	Description of Job				
No. 3	SAME AS MAXWELL.				
	MATERIAL				
	1 Header gasket, included in total.		11 hrs.		\$18.60
	OPERATION PERFORMED SAME AS MAXWELL PLUS REMOVAL OF ALL CAM FOLLERS WHICH ARE REGROUND AT CAM END TO QUIET TAPPETS.				
	Labor rate \$1.50 per hour.				

CADILLAC—Eight Cyl. Models.

Operation	Description of Job	Parts	Max.	Labor	Total
No. 3	SAME AS MAXWELL.	Prices	Time	Charges	Charge
Operation	Description of Job				
No. 3	SAME AS MAXWELL.				
	Includes new inlet manifold gaskets and parts necessary in grinding of valves such as port plug gaskets or cylinder head gaskets.				\$18.80
	PRICES BASED ON LABOR RATE OF \$1.50 PER HOUR.				
	Use Cadillac Special valve lifter and tappet wrenches.				

THIS OPERATION IS PERFORMED SAME AS ON ANY STANDARD CONSTRUCTION.

The old models have a solid head construction and it is necessary to remove port plugs, carburetor and generator. Later models have removable head and only the carburetor is removed for operation No. 3.

BUICK—Models H to 22, Inclusive.

Operation	Description of Job	Parts	Max.	Labor	Total
No. 3	SAME AS MAXWELL.	Prices	Time	Charges	Charge
Operation	Description of Job				
No. 3	SAME AS MAXWELL.				
	Burn carbon, clean and adjust plugs, set push rods, reface and regrind all valves and cages, oil valves and rocker arms, check valve timing and tune engine.				
	4 cyl.		5 hrs.	\$6.75	
	6 cyl.		6 1/2 hrs.	8.78	

THIS OPERATION IS PERFORMED IN SAME MANNER AS ANY OTHER STANDARD CAR EXCEPT THAT HEAD IS NOT REMOVABLE AND VALVES ARE CARRIED IN REMOVABLE CAGES.

(Continued from page 10)

Productive and Unproductive Labor

An hourly labor charge to the customer of \$2 per hour would not be an excessive charge for the small shop operating on the old hourly basis. As a matter of fact it will be found that when the unproductive labor is deducted from the total number of hours that it will require an hourly rate very near this figure if the establishment is to show a profit. One of the greatest virtues of the flat rate system of selling repairs is its ability to increase the number of productive labor hours from a given number of clock hours.

To make the statement a little clearer, a definition of Productive and Unproductive labor will help. The total number of hours that a mechanic puts in at the shop are the clock hours. Mechanic No. 1 has 148 clock hours, 5 were put in on guarantee labor to correct bad workmanship, 10 for assembling new cars, and 4 for straightening up the tools and overhauling machine equipment. The remaining 129 hours were spent on repair jobs. As far as the shop is concerned, the 19 hours are Unproductive labor and the 119 Productive labor. The assembling of new cars may be charged to the Sales Department but the only way to absorb

the nine hours is to charge it to Overhead Item No. 1 or No. 5.

Now let us see how Flat Rate increases the number of productive hours as compared to the hourly rate of selling repairs. We will assume that the Flat Rate schedule has been compiled on a basis of \$1.35 per hour. If we sell 37 operations that are based on a maximum time limit of 4 hours each, we have used the 148 hours. The men are working for an incentive however and they complete the 37 operations in 112 hours, which is a small saving of time as compared to the actual savings being accomplished under Flat Rate to mechanic and customer. The hour rate then becomes \$1.36 which, if figured out, will offset the loss incurred due to unproductive labor. **THIS IS THE BIG REASON FOR SELLING REPAIRS AT A FLAT PRICE.**

Those who have not tried the flat rate system will be slow to believe that a well managed shop can consistently accomplish Flat Rate operations well under the time limit allowed in the schedule.

For the sake of showing another advantage of the Flat Rate system, we will consider that the flat rate schedule has been compiled to such fineness that efficient workmen with time saving tools can just meet the maximum time limit of the Flat Rate schedule. To provide a factor of safety, the merchant can raise

the Flat Rate price with no bad effect on the car owner. Increasing the rate per hour charged customers when operating on the old system is far more delicate than increasing the Flat Rate price.

It is easy to imagine the car owners reaction to an announcement that your labor charge is to be increased on a certain date from \$1.25 per hour to \$1.75. Nevertheless you can incorporate such a necessary increase in the Flat Rate price of a four hour job by adding \$2 to the old price.

Another Common Mistake

There are several other common business mistakes that are often made by the establishment that does no bookkeeping. One is the case of the fellow who erects a new building which is to serve as his shop or store. We will say that the building cost \$6,000 to construct and that he is wisely charging a depreciation of 5 per cent. This is usually as far as the average man will go in considering his costs, but if he stops there he is cheating himself.

If the building were rented to someone else it would bring in a certain amount of rent and although he is the owner, he is also the tenant and the business should be charged the same amount of rent as the building would bring if rented to a stranger.

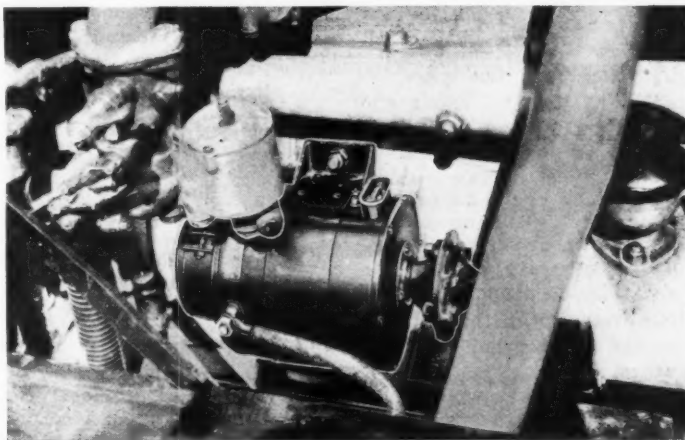
North East Generators for Bus Lighting Service

THE North East Electric Company has developed a heavy duty generator known as their model LG for bus lighting service. The external appearance of the machine is practically the same as the motor generator used on Dodge cars, but electrically it operates as a generator only and not as a motor.

It is used in connection with a 12 volt battery which it is capable of charging at the rate of 20 amperes, although by means of third brush adjustment the charging rate can be reduced to 5 amperes. The generator cuts in and begins to charge at 850 r.p.m. and generates its maximum current at 1450 r.p.m. It is a 4 pole shunt wound machine and the adjustment of the third brush previously referred to can be made from the outside. For the protection of the field winding a fuse is used, located at one end of the generator on the outside where it is readily accessible.

One of the illustrations shows the end bracket removed and exposes the brushes and holders together with the brush shifting mechanism. The other illustration shows this machine as installed on a Fifth Avenue coach, New York City.

In addition to the current regulation by means of the third brush it is also used with a voltage regulator which, even with

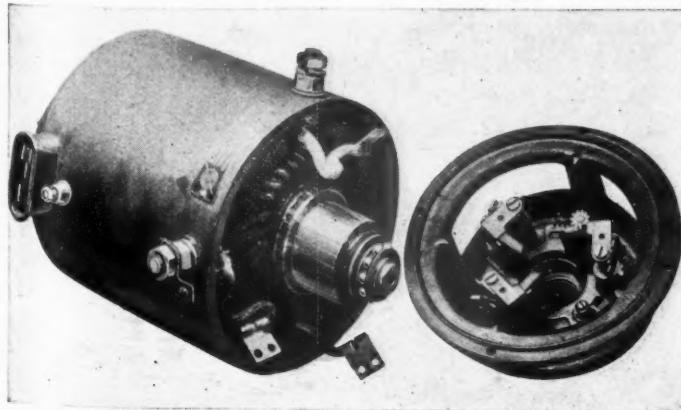


Heavy duty North East generator installed on a Fifth avenue coach, New York City

battery disconnected, is said to hold the voltage at a suitable value.

Either terminal of the battery may be grounded although it is recommended that the positive terminal be grounded in accordance with S. A. E. standard practice. The drive may be either 1½ to 1 or 2 to 1, as compared with the engine speed, and the generator operates easily up to 5000 r.p.m. This machine is rated at 300 watt and is 6 9/16 in. outside diameter and 11 in. in length, while a larger machine is also produced being rated at 600 watts. Its dimensions are 7½ in. diameter and 11¾ in. length. Wiring recommended for the circuits specifies 00 for the starting circuit, No. 8 wire for the main charging circuit and heavy lighting mains, No. 12 wire for the lighting circuit which carries a portion of the current and No. 14 wire for circuits carrying 1 ampere or less.

The North East Electric Company also have a standard machine known as LA which is rated at 150 watt and is suitable for bus lighting service where the current requirements are smaller.



Model LG North East bus lighting generator with end bracket Removed

Eddie Hearne Wins Kansas City Race at 105.76 M.P.H.

*Drives Durant Special to Victory—Duesenberg Driven by
Lewis Is Fourth*

Kansas City, July 5.
CIRCLING the giant one and one-quarter mile speedway at an average speed of 105.76 miles an hour for the entire 250 miles, without making a stop, Eddie Hearne of Los Angeles, a native of Kansas City, driving a Durant Special, won the second national championship race held over the Kansas City speedway July 4.

His official time for the distance was 2 hours, 21 minutes and 21.15 seconds. Earl Cooper, in an H. C. S. Special, was second in 2:27:35.83. His average speed was 101.65 miles an hour. Harlan Fengler, in a Durant Special, driving his first race over a board track, was third, making the distance in 2:44:54.88. His average was 90.95 miles an hour. Dave Lewis, in a Duesenberg, was fourth, his time being 3:03:24. Frank Elliott, in an Elliott Special, was fifth. Only five cars finished, while 12 started.

Hearne's time for the distance was somewhat slower than the record for 250 miles, which is 115.60 miles an hour, established by Jimmie Murphy on the Los Angeles track. It is slower than the average time of 107.86 for 300 miles made by Tommy Milton in winning the first race here last year.

Milton, Murphy, Hartz, DePalma and Ora Haibe were all forced from the race by burned-up bearings or broken connecting rods.

The race could hardly be classed as a victory for the one-man cars, but if the veteran drivers who were forced out of the race are correct, the new type of car is the proper one, and with some improvements in the oiling system, will be the established racing car of the future.

All of the cars which finished, except the Duesenberg, were powered with engines built by Harry A. Miller of Los Angeles.

The race at the outset promised to be

Winning Drivers and Time Made in Speed Classic

Winners in the 250-mile race at the
Kansas City speedway were:
(Official)

	Time	Mi. per hour
1. Eddie Hearne, Durant Special....	2:21:21.15	105.76
2. Earl Cooper, H. C. S. Special....	2:27:35.83	101.65
3. Harlan Fengler, Durant Special....	2:44:54.88	90.95
4. Dave Lewis, Duesenberg Spl....	3:03:24	81.79
Frank Elliott, Elliott Special....	Not taken	.....
(Signed) P. C. POMMER,		Chief Scorer.

one of the most spectacular in the history of motor car racing, but dwindled down to an endurance contest as driver after driver met with some mishap and was forced to withdraw. Exclamations of disappointment went up from the grandstands as such favorites as Jimmy Murphy, Tommy Milton and Ralph DePalma retired to their pits.

The misfortunes of Milton, Murphy and Harry Hartz were strokes of fortune for Hearne. Through the first 65 miles of the race when Murphy, setting the pace at 119 miles an hour, was chasing his challengers for first place into their pits disabled, Hearne was nowhere among the five leaders.

But he was persistently dangerous while Milton, Murphy and DePalma, alternately, set the terrific pace, and clung so closely within striking distance that when mechanical troubles beset the machines of the leaders he was at hand to step into the vanguard with a lead over his followers that practically as-

sured him the victor's purse. From the 135th lap, when he overtook Murphy in his pit, the race was Hearne's.

Milton and Murphy had the lead-off positions and as they flashed over the wire in the official start Murphy took a slight lead. This he maintained for two laps when a burst of speed by Milton carried the latter ahead, but for only one lap. In the first ten miles, while the speed was being maintained at nearly 111 miles an hour, the pace was set first by Murphy, then Milton, back to Murphy and then to DePalma in his Wade Special at the start of the twelfth lap.

On the back stretch in this lap Milton again forged to the front and maintained his advantage for the next 15 miles, until his engine was stricken by the killing pace. He fell rapidly to the rear and left the track at the end of the 39th lap.

Then for five laps DePalma again showed his heels to the pack until overtaken by the fierce-driving Murphy at the 30th lap. By this time the race had resolved itself into a battle between Murphy, Hartz and DePalma.

Pressing his car into a pace of 119 miles an hour, Murphy crept away from the field and, gaining almost a lap on Hartz, rode on the heels of his teammate until Hartz's car left the track at 130 miles as a result of a tire blowout.

With Hartz out of the way, Murphy had a two-lap advantage on his nearest foe, Hearne, who had, by this time, come into second position. Cooper was 11 laps behind in third place. They raced in this formation until the 135th lap, when Murphy went to the pits and lost his lead to Hearne.

The race then resolved itself into a matter of time with victory for Hearne obvious. Cooper was running second, Fengler third, Lewis fourth and Elliott fifth, the order in which they finished.



Drivers, mechanics and officials in charge of the Kansas City Race



Eddie Hearne

The race was the first time the new 122 cubic inch displacement cars paced a board track. The Indianapolis track is of brick, much longer than the local bowl, and the turns are not banked to an appreciable angle. There the engines held up better because the drivers had to take the turns with their engines shut down. This afforded a moment in which the engines could cool to a certain extent.

The drivers, to hold their pace on the bowl here, had to keep their throttles open the entire round of the track. The scavenger pumps proved inadequate at the high speed. They were not of sufficient capacity to keep the oil out of the sump and into the main oil pump. This allowed the main oil pump to suck air instead of oil and as a consequence, main bearings, connecting rods and crankshafts burned out.

In the old cars of 183 cubic inch displacement the engines turned over 4000 to 4500 revolutions a minute. In those cars the scavenger pumps were able to hold up. But in the 122 cu. in. cars the crankshafts turn 5000 to 5500 revolutions a minute at the speed shown here and the pumps failed to keep up with the pace.

The average speed was greater here than in Indianapolis.

Jerry Wonderlich, driving a Durant Special, was forced to give up in the eleventh lap. His car suffered a broken clutch.

Bennett Hill, with a Duesenberg, rolled into the pits in the twentieth lap when his car parted its oil line.

Ora Halbe, in another Duesenberg, dropped out in the thirty-eighth lap with engine failure.

Tommy Milton, in his H. C. S. Special, after leading the race in a number of laps, was forced to go to his pit and quit in the thirty-ninth lap when a bearing burned out.

Ralph De Palma, driving the Wade Special, was forced to give up in the sixty-first lap. This killed the enthusiasm of the spectators, for DePalma had been in the lead a number of times. A broken connecting rod, due to faulty oiling, caused him to stop.

Harry Hartz, in a Durant Special, rolled his car off the track in the 103d lap after he had blown a tire and skidded off the track into the infield. The accident had jarred the car's transmission out of alignment.

Jimmy Murphy, in a Durant Special, held the lead almost throughout the race until the 137th lap when he stopped for oil and gas. After a fresh start his car would not pick up and finally in the



Carl Cooper

146th lap the car was forced to stop.

The remainder of the race was somewhat of a joyride for the participants. The crowd lost interest in the five cars racing around the track and the race, after the leaders were forced to quit, was exceedingly tame.

Kansas City and Indianapolis Races Compared

The fact that the Kansas City race was the first official test of the 122 cu. in. racing cars on a board track makes it of interest to compare some of the salient features of that race and the Indianapolis race which was held May 30, as follows:

	Kansas City	Indianapolis
Winning driver.....	Eddie Hearne	Tommy Milton
Winning car.....	Durant Special	H. C. S. Special
Average speed.....	105.76 m.p.h.	90.95 m.p.h.
Distance of race.....	250 miles	500 miles
Around track.....	1 1/4 mi.	2 1/2 mi.
Track surface.....	Wood	Brick
No. cars starting.....	12	24
No. cars finishing.....	5	11
Approximate attendance.....	60,000	150,000
First prize.....	\$8,000	\$20,000

The difference in speed is largely accounted for by track construction and distance. The turns of the Kansas City track are well banked so that it is not necessary to slacken speed to make them, while at Indianapolis the speed of the straight-aways cannot be maintained on the turns. Persons familiar with both tracks are of the opinion that the Kansas City showing was comparatively no better than that at Indianapolis.



photographed just before the start. The cars are lined up ready for the bomb

Making the Owners Sell the Cars



Miss Agnes Crowley, 383 But-
tles, Ave., says:

"Have driven my Reo car for a year with very good success. I have no hesitancy in driving this car in traffic, as it seems to know just what to do."

Agnes Crowley

(Copyright, 1922, by Frank B. Wilson.)



Miss Jane Addison, 1756
Bryden Rd., says:—

"We have had automobiles for five or six years, but find that our new Reo Sedan handling is nicer and is by far more comfortable than any other."

Jane Addison



Miss Sophia Turkopp, 132 E.
Town St., says:—

"The first two Reos that we had were such satisfactory cars that, when we decided to buy a new machine, of course it was another Reo."

Miss Sophia Turkopp

(Copyright, 1922, by Frank B. Wilson.)



Mrs. Jake Corder, 997 Living-
ston Ave., says:—

"Our Reo certainly is a real Automobile. It is a 1916 model and is still in good condition. We use it every day."

Mrs. Jake Corder

(Copyright, 1922, by Frank B. Wilson.)



Mrs. J. J. McNamara, 502 S.
Harris Ave., says:—

"Ownership of a Reo car insures one of a maximum degree of safety and comfort, and complete ease in regulating the driving speed."

"We have driven our car, a Reo Six, 26,000 miles, and it goes without saying that our next car will come from the Reo line."

Mrs. J. J. McNamara

(Copyright, 1922, by Frank B. Wilson.)



Mrs. J. F. Stehle,
858 Linwood Ave.,
says:—

"If any woman is undecided in buying a car, I would suggest a Reo, as it is surely a fine driving car, as well as most comfortable. The clutch and brake combined is indeed a great advantage. We have taken several long trips with greatest satisfaction."

Mrs. J. F. Stehle

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Mrs. Louis Lakin,
675 Oakwood Ave.,
says:—

"I wish every woman could have the pleasure of owning a Reo. It is such a wonderful way of getting out with the youngsters."

Mrs. L. Lakin

(Copyright, 1922, by Frank B. Wilson.)



Mrs. E. E. Chamblin, 297 W.
10th Ave., says:—

"We purchased our first Reo in 1912, and our second in 1914. We drove that car for seven years, and now are driving our third. There are five members of our family who drive the car; it is so easy to handle."

Mrs. E. E. Chamblin

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MRS. T. G. COOK,
907 S. Champion Ave.
Says:—

"I had eight years of very good service from my 1915 Reo Touring Car."

Mrs. T. G. Cook

(Copyright, 1922, by Frank B. Wilson.)



Mrs. H. W. Boyer, 1695 Bry-
den Road, says:—

"My Reo Sedan is an economical and easy car to operate and a fine hill-climber, as I tried it out over the mountains on a trip to Washington, D. C."

"I am now driving my third Reo and I think that each one I get is better than the one before."

Mrs. H. W. Boyer

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Miss Sabina Althaus, Bexley,
Ohio, says:—

"Two years ago I purchased a Reo and my experience with it has been most gratifying. After more than 20,000 miles, it is running on one of the original tires, with another as a spare. As a durable and dependable car, I take pleasure in highly recommending it."

Sabina Althaus

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Mrs. Jennie Williams, 165 Jef-
ferson Ave., Says:

"Our first car was a Reo and our second is a Reo, and if the second proves as satisfactory as the first, our third will be a Reo."

"I think the Reo is the best car on the market for the least money, and am more than pleased with our new Sedan."

Jennie Williams

(Copyright, 1922, by Frank B. Wilson.)

The 12 ads shown on this page are part of a series of 20 which ran in the Columbus, Ohio, State Journal. They created a lot of Reo interest in Columbus and are novel in that they are all in the form of testimonials written by women and appeared in good positions on the Women's page of the Journal. It is a unique campaign for turning Reo owners into salesmen

The Mechanical Side of the Tire Dealers' Business

Service as an Aid to Sales and What Is Needed in Equipment and What Can Be Expected From the Shop

Eighth Article

It is not the intent, in presenting this article on the mechanical side of the tire dealer's business, to infer that a successful tire dealer must establish a repair shop. There should be such a shop in every trade community in justice to the tire users. To-day many large tire dealers do not maintain a shop, but have arrangements whereby their repair work is done by shop under other management.

There are certain benefits in this sort of operation. If a tire repair shop can be assured of sufficient work, repairs are made more economically and the workers are better content with their jobs. Often a good tire mechanic is an indifferent salesman and he really makes more money when he works for other dealers, rather than on his own sales of service. In this case the tire dealer must assure himself that the shop can turn out satisfactory work and then stand behind it, the same as though it came from his own shop.

NOT so long ago in the sale of motor cars, it was thought that the maintenance end was a necessary evil. Now it is recognized that sales will not long continue, unless car owners can find at their disposal a reliable shop where the repairs needed from time to time can be made.

Similarly in the merchandising of tires, an occasional sales manager will be found who takes the same attitude, thinks that the tire repair shop is a nuisance, and either gives it little attention or else has none, letting his customers go elsewhere when a broken pop bottle sends to the hospital a tire that otherwise is good for many miles.

A survey of the various tire establishments will show in general that their sales success is nearly always in proportion to the service they can render. Nor does this mean that the man selling tires, must himself provide that service, but he must see that it is made available to his customers. If he leaves it to a competitor, the competitor will also sell the next tires that are needed.

Vulcanizing itself, is apparently not highly profitable as a separate business, but

with careful management it can be made at least self supporting, and can be practically indispensable from the standpoint of sales it brings in.

One salesmanager said, "I credit our shop with from 75 to 90 per cent of the sales we make," while a branch manager for one of the large tire concerns said, "I would hardly consider a representation for our tires, where they were unable to give vulcanizing service."

What's Wrong With Vulcanizing?

Primarily there is nothing wrong with vulcanizing as a business, although a number of factors have brought it into disrepute in the last few years. One of these factors, in the days when prices on new tires were higher than they are now, was the overzealousness of the tire repair men in the matter of retreading. From the advertisements, retreading was the universal panacea for the car owner malady known as car upkeep.

Good tires, rotten tires, tires with carcass whole or carcass punctured; all went through the retreading mill, many of them to blow at the end of a few miles. The confidence of the car driving public was badly shaken, nor has it yet been replaced, as far as the tire shop is concerned. Retreading has its field but it is necessarily a limited one, and the repair man who allows his desire for immediate profit to overrule his better judgment is wrecking his own future business, and that of his fellows.

Very few tires are worth retreading. In the first place the average tire is used, not only until the tread is worn off but until considerable wear has been born by

The first five articles of this series were published as follows:

May 24—Now Is the Time to Add Tires to Your Transportation Store.

May 31—Tire Sales Not "Small Change," Totals Run Large.

June 7—What Tire Makers Are Doing to Make Tire Selling a Better Business.

June 14—Some Things the Tire Manufacturer Can Do to Improve Tire Merchandising.

June 21—Competition You Must Expect in Tire and Some Suggestions.

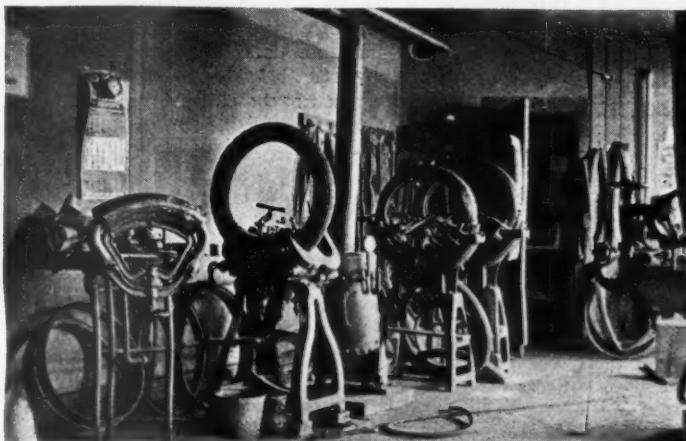
June 28—What the Tire Dealer Can Do to Promote Tire Trade.

July 5—Long Dating on Tire Sales Is Destructive to Tire Merchandising Success.

the carcass. Retreading such a tire is absolutely wrong. Then there are other cases where there are breaks in the carcass. These also should be junked. Once in a while a casing will be found where the carcass really is good when the tread is gone. Such a job is worth while to the customer, and consequently to the shop.

Retread tires however, have a life somewhat more limited than that of new tires. The process of vulcanizing the new tread to the old carcass, necessarily overvulcanizes the rubber binder in the fabric or cords. Overvulcanized rubber loses its life and resiliency, so that the strength of the retreaded tire is less than a new one.

Take for example a tire which new costs \$50 and which with reasonable care should give 10,000 miles. Let us further suppose that this tire is mounted on a front wheel which is not properly aligned, and due to this condition, the rubber is rubbed off the tread after running some 6,000 miles. Such a tire if retreaded should be good for from 3,000 to 4,000 miles, considering the aging of the carcass which takes place when the new tread is put on. On this basis it would



A typical tire shop

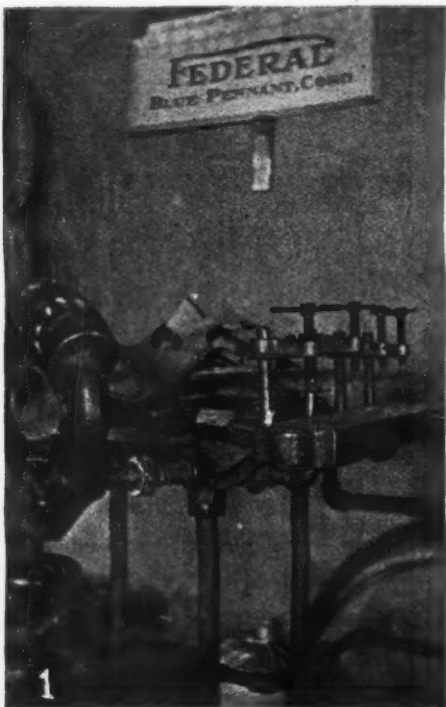


Fig. 1—Tube plate at the right. Inside vulcanizer at the left

be worth from \$15 to \$20 to the customer, considering the cost of a new tire.

Repair job tire mileage is an estimate at best, and some shops estimate 70 per cent as a reasonable mileage as compared with the new tire. If the customer should get 7,000 miles from the repaired tire, he would make money, while if he paid \$15 and got 3,000 miles he would just break even as compared with the cost of a new tire. The example shows however, that it is possible for the customer to save money, if the tire man uses discretion in recommending retread jobs.

What's Needed for Service?

As far as serving customers is concerned, the practice of retreading may be relegated to the discard, for in addition to having a questionable value as far as the customer is concerned, it is also a competitor of new tire sales.

Not so however, with the patching of tubes. This is work that is needed almost daily by the car owner, and if you are equipped to do the job right it keeps you constantly in touch with him and with his needs. Then when the old tire has served its time, the purchase of a new one at the place the owner knows best, is only natural.

Starting a Shop

The most vital factor in the vulcanizing

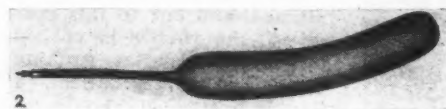


Fig. 2—The air bag

shop, is the man who does the work. You can have a shop ever so well equipped, but if the man you employ is not inter-

ested in your business, is on today and off tomorrow, you will have trouble rather than business from his work. Even realizing the need of tire service for their customers, some salesmen have hesitated to start vulcanizing service because of the labor question.

The same problem however has to be met in any shop, and the answer is in giving the man an incentive, whether this consists of a commission on sales, decent treatment, or some other thing which makes his work his business, not his task.

One way to get a man is to hire one who knows the vulcanizing business, preferably one who has worked in a tire factory. Such a man is valuable but possibly expensive, especially if a shop is just being started and the volume of work at first is not great. Another possibility is to take a trusted employe and send him to a tire factory for a short

The tire dealer who plans only to sell tires and either pass entirely the repair work or have it done by a vulcanizing shop elsewhere, needs some tools of his own. There is a certain service, such as changing tires for the customer, that cannot well be avoided at times. The minimum of tools required are:

*Quick lift jack
Combination brace wrench for rim nuts
Rim compressor
Putty knife for scraping inside of rim
Five pound copper hammer
Air gage
Air compressor and air line
Tire irons for clincher tires
Four in one valve tool for removing stuck valve insides and recutting burred threads.*

All tire dealers should sell (and have at hand for emergency use), boots, quick repair materials and air gages.

period, to learn vulcanizing. Some of the equipment concerns have also at times made it possible for prospective customers to learn the trade.

If the dealer's son or partner can get this experience, he need not necessarily confine himself to doing the work, but can then break in some good mechanic on the job, and in case the man leaves, can fill in on the work for the time being until he can train some one else. If the employe only knows the work however, the shop is handicapped should the one man leave.

Equipment Needed

A rather limited amount of vulcanizing equipment may be used in starting the shop.

A tube plate is needed, this being heated either with steam or electricity, both types being available. For work on casings an inside vulcanizer and a side wall and bead vulcanizer should be secured as well as a section mold. The in-

side vulcanizer as its name implies takes care of inside patches, while the side wall and bead vulcanizer is similar but takes care of repairs without overheating the rubber in the center of the tire section.

A typical steam heated tube plate is shown at the right in Fig. 1 while at the left in the same illustration is an inside vulcanizer. To hold the casing tightly against the heated iron, as in a section mold or bead vulcanizer, it is necessary to use what is known as an air bag. Fig.

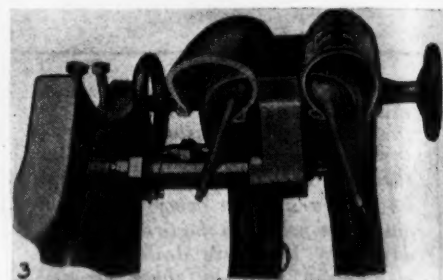


Fig. 3—Side wall and bead vulcanizer in action

2 illustrates one of these air bags, a sort of india rubber sausage capable of being inflated to any desired pressure. Fig. 3 shows a side wall and bead vulcanizer in action, with the air bags referred to, shown doing their part in maintaining proper pressure between the tire and the mold.

To make the patch stick, it is essential that the old surface be thoroughly cleaned by buffing, this being true whether the repair is on a tube or casing. Fig. 4 shows such a buffing machine, it consisting essentially of a motor mounted on a stand, and provided with various wheels. On some work an emery wheel is needed, in other cases a rotary rasp, while a rotary wire brush is the means commonly employed to insure a surface to which the cement will stick.

For work on large tires, and lately even on small sizes a small portable out-

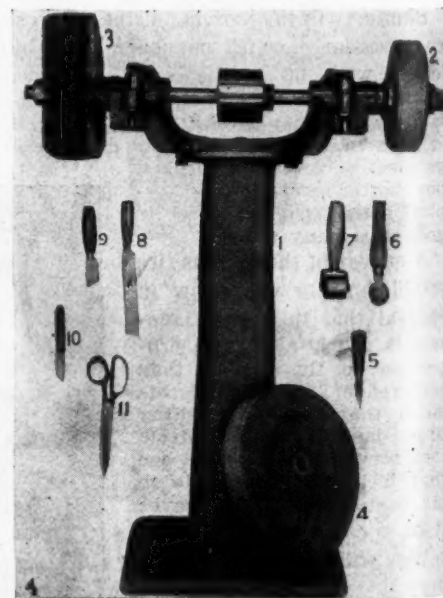


Fig. 4—Buffing stand and small tools needed in the vulcanizing shop

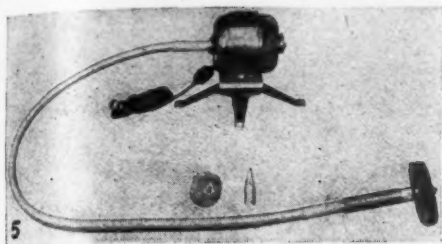


Fig. 5—Flexible shaft buffing outfit

fit with flexible shaft is often used. This is shown in Fig. 5 and is commonly supplied with the three wheels, that is emery, wire and rotary rasp, as in the case of the larger outfit. For buffing tire interiors this sort of an outfit has obvious advantages.

Small Tools Needed

In addition to the large pieces of equipment, there are a few small tools which are comparatively inexpensive, but necessary. They are illustrated in Fig. 4. In this illustration, No. 5 is a stock knife with adjustable blade, No. 6 is a corrugated ball bearing stitcher, No. 7 is a ball bearing flat roller, No. 8 a skiving knife, No. 9 a notched fabric knife, No. 10 a fabric and No. 11 a pair of rubber shears.

Skiving is the process of beveling or chamfering the edge of a patch or liner so that it tapers down to a fine edge. This is done to insure smooth work, and avoid ridges, which would injure the tube when the tire is put in service.

In addition to the equipment mentioned, a good work bench is of course needed, and this should be supplied with a tire last of the general type shown in Fig. 6, this being an iron form the shape of the inside of the tire. The tire, to which the section is to be applied, is then slipped over the last, where it is held in shape and also in a convenient position while the work is being done. Fig. 7 shows a repairman using a tire last for applying a section, while Fig. 8 shows the tire being placed in the mold.

Cost of Equipment?

No definite figures can be given as to the cost of equipping the shop as these will vary with the make and type of equipment selected.

Some variation will also occur with the type of boiler used. Many shops use one boiler which supplies steam for all molds. More recent equipment however, is designed so that separate smaller boilers integral with each mold may be used. Where all molds are not working all the time, such application is more economical in gas consumption.

For from \$700 to \$800 however, it should be possible to get the tube plate, section mold, bead and side wall vulcanizer, inside vulcanizer, with suitable boiler equipment, necessary air bags, buffer, tire last and small tools previously mentioned.

Additional Equipment

It is of course assumed that a dealer figuring on the addition of a vulcanizing shop is already equipped with high pres-

sure air. If not he would have to get an air compressor to supply his shop and his customers. Then there are a few other items of equipment, which although not absolutely necessary, go a long way toward giving satisfactory service.

One of these is a quick tire change tool for squeezing the rim inward so that casings may be quickly removed. Where much tube repair is done, such a tool should quickly pay for itself in the time it saves.

The need of the right tools was illustrated at a vulcanizing shop where equipment in the amount of some \$2,000 is in use. A big car drove up with a flat rear tire, and one of the workmen went out to take care of the job. About five minutes later, an angry voice was heard to say, "I can't wait all day." Then the starter growled, and the car went bumping off down the street.

The tire man had been flat on the ground under the gas tank trying to get an ordinary jack under the axle. The jack would not go low enough and his efforts had been futile. A quick lift jack, as a piece of service equipment, would have handled the job. With the wheel in the air, and the casing off the owner would not have driven away. The tire in question was blown, so that air pressure could not be used to raise the car, even temporarily, and the fact that it was blown meant that the lack of this equipment also meant the loss of a good repair job, or possibly the loss of a tire sale.

Good service brings in business, while poor service is often worse than none. Ten chances to one that car owner will never stop there again, even if he is quite sure they have what he wants. One such experience is usually deemed sufficient by the average individual.

When it comes to giving service, the ability to show the customer what is wrong with his tire and what has caused

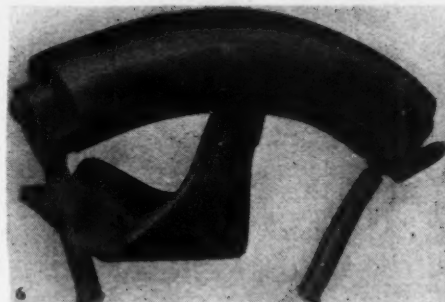


Fig. 6—Combination tire last

it is of prime importance. Suppose for example that a tire has been purchased from a dealer and before it is time for it to wear out it develops some condition which the purchaser thinks is a defect.

Such a tire when brought to the dealer should be put on a tire spreader as shown in Fig. 9. Here it can be pulled open, and the inspection thus made possible, together with an intelligible explanation from a good tire man, will hold a customer, who might otherwise think he had been imposed upon. Even in the shop work such a tool is quite valuable, for it makes it easy to open a stiff tire, for any work necessary on the inside.

Even with the best of "show me" equipment, it is not always easy to convince the purchaser of a tire, that it has really given all the service that could be expected, considering the conditions of service. This is only natural, for the customer feels that the test is likely to be in the nature of an alibi and in most cases the explanation does not mean a great deal to him.

This condition, combined with the difficulty of keeping an employee interested in his job has lead numbers of tire dealers to, in a sense, subsidize a shop, which is nominally independent, and yet which functions as a shop department for the retail tire sales department.

This is conveniently done when the transportation store is located on a corner with the salesroom on the most prominent street. In the back of the store and with its entrance on the side street, there may be the vulcanizing shop, and its operation may be turned completely over to one or two men, who run it as their own business. They will hang out their sign and operate as though independent of the store in front.

If suitable men who have the money can be interested, they can equip their shop with the assurance that they will get all of the repair work that is taken in at the front door, and also all they can get on their own hook. If men are available who know the business, but are not able to pay for the equipment needed, the dealer may make some arrangement whereby they can buy out the place on a time basis.

Such an arrangement gives the men an incentive. They have their own shop, and work harder than if on a salary. Then when an adjustment is asked for, the customer can be taken to the shop around the corner, where the tire man can give the dealer and his customer a



Fig. 7—At the bench installing a section



Fig. 8—Putting tire in mold to cure the section

technical opinion as to how far the tire has really been run, and as to what has really caused the trouble.

What to Charge

No prices can be fixed which would be right for all locations and all conditions under which business must be done. The same general rules however apply to the tire repair as to any other business.

Selling tire repairs at less than cost will wreck that end of the business, if not the whole dealer establishment. One repair shop claims to take care of 50 tube repairs a day in their rush season. They charge 50 cents per tube, which sounds as if the profits would be good. They include removing the tube from the casing at this figure and only charge 15 cents extra if the casing must be removed from and reinstalled on the wheel.

The bookkeeping consists of notes on the margin of various magazines that lie around the shop, and the white portion of the newspaper wrapped around the proprietor's lunch. The receipts amount to some ninety or one hundred dollars a week, which is way low for the amount of work done, and due to the type of books kept we have some doubt as to whether the repair man really knows what he does or what he gets for it. One thing he knows, and that is that he is always broke and does not seem to make as much as the man he hires.

This is of course no indictment of the tire repair business, for right prices and a little accounting should put this business on its feet.

The tube job including removal and replacement in the casing probably takes half an hour, which at fifty cents hardly pays for the labor, and leaves little over for overhead expense, material used and margin for the equipment of the shop to say nothing of profits, while the charge of fifteen cents for wheel service is obviously low.

Perhaps such conditions are produced by a type of competition too often seen. If so the type of service should be raised, and the prices with it, which would draw

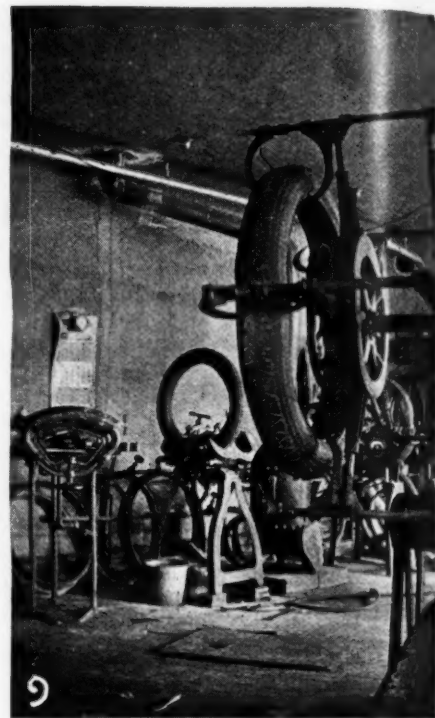


Fig. 9—A tire spreader makes inspection of the inside easy

a class of trade to which it would pay to cater. The sales producing power of the properly operated vulcanizing shop must of course be seriously considered, but at the same time, it should be able to stand on its own feet.

Illustrations of Figures 2, 3, 4, 5 and 6 available through courtesy of the Western Rubber Mold Co., Chicago.

23 Years Ago This Week In MOTOR AGE

(From MOTOR AGE of July 12, 1900.)

Madison Square Show

NEW YORK, July 9 (1900)—Official allotment has been made on the main floor of all the spaces save two for the show of the Automobile Club of America at Madison Square Garden, Nov. 3 to 10. These two will probably be allotted to the Waltham Manufacturing Co. and the American Electric Vehicle Co.

On either side of the center aisle are: Winton, Waverly, Stanley, Riker, Locomobile, Electric Vehicle Co. and Automobile Co. of America, of Marion, N. J. On the outer circle of the oval are: Electric Vehicle Co., Daimler, Canda, National Automobile and Electric of Indianapolis, De Dion-Bouton Motorette, Le Roche & Co., of New York; United States Automobile Co., Attleboro, Mass.; L. M. Harris, and Foster of Rochester.

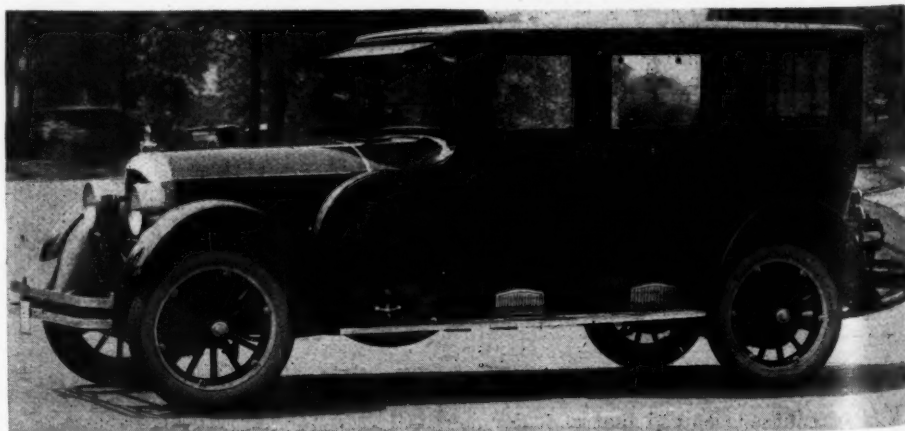
CLEVELAND, July 9—H. A. Lozier, Jr., stated today that the Lozier Motor Co. of Toledo, of which Mr. Lozier, Sr.,

is at the head, had decided to accept the proposition made by Plattsburgh, N. Y., business men and will erect its launch and automobile factory in that little city, which is located at the head of Lake Champlain.

NEW YORK, July 9—With the return of C. J. Field from abroad comes the announcement that an American company

with large capital and ample facilities will have the complete United States business of the De Dion-Bouton Co. of France for their motors and "motorettes," as the new company designates their light vehicles, corresponding to the French "voiturettes." The new company will be known as the De Dion Motorette Co., and will have its offices and factory in New York.

Paige 7-Passenger Sedan



This car has a double bead rail extending around car from the front panel. Former model carried only bead around base of windows. Change designed to enhance streamline effect

Passenger Car Dealers Can, and Are Selling Trucks

Chief Problem in Closing a Deal Is to Find What Question Is in the Mind of the Man Who Is Slow to Buy, Then Answer That Question

FOR a number of years there was considerable controversy as to whether the car dealer could sell trucks. As we remember it, the verdict was that he could not. In the main that verdict was accepted and the controversy ended. Since then little has been said about the car dealer selling trucks.

During this period of silence, some passenger car factories developed very good light trucks, or perhaps they may be better described as commercial wagons. Without fuss or raising any questions as to who could or might sell these trucks, these car manufacturers let the truck department suggest to the dealers that they sell and service these commercial wagons. Some dealers, not knowing that the verdict had been that they could not sell trucks, went right ahead and sold them.

Also these dealers, not having listened to the foolish preachment that maintaining a truck was fundamentally a different job than that of maintaining a car, let their shops work on these trucks. The mechanics found that a truck was powered with an internal combustion motor, that the explosions occurred at regular intervals and that the power was delivered in the same general way. Although the dimensions of some parts were different, the principle was exactly the same.

And so it happens today that we find that the commercial wagons made by passenger car factories and sold by passenger car organizations top the list of trucks. Of the eleven trucks that lead the registration, six are manufactured by passenger manufacturers, five are made by exclusive truck makers. These eleven makes are said to constitute about 73 per cent of all trucks.

And so we realize today that the car dealer can sell trucks if he does not get too much up stage about it. If he just drops naturally into the business, he apparently can make it go. In fact, a very large number of car dealers have made it go.

There is much controversy about how to sell trucks and much of this is beside the point, just as much of the formal talk about anything is beside the point. An advertising salesman recently sought an audience with an advertising agent to sell him some space. The salesman was feeling very much like putting a big job over, so he pitched first thing into his best argument, that of establishing in this customer's mind what an excellent magazine he represented, how

strong it was editorially and so on. After about 30 minutes of strong talk, he paused for breath and the customer remarked:

"I am glad to hear this Mr. Jones, but you do not have to sell me on the character of your magazine. I read it and believe in it."

The point we want to make is just here, the way to sell a car or truck to any man or woman is just the same as the problem of the successful fortune teller. First you have to find out what this customer wants to know. Few cars are today sold on specifications, but a few are. A quick sale of a car was made the other night by permitting a man, his wife and daughter to sit in the front seat of a certain four cylinder car.

These people had faith in certain cars and their only problem was to get a car that the three of them could sit in the front seat of when they took some relatives out for a drive. They had tried two cars and could not sit comfortably. The salesman for this particular car found out their problem, let them solve it and the sale was completed in 20 minutes.

Along this line, Homer J. Buckley, who conducts a large printing establishment, recently told how he bought a truck. The story applies because it shows how 10 failed and the last one succeeded. As Buckley tells the story, it goes like this:

"My brother, who has charge of our transportation, came to me and asked why we could not have our own trucks. He said we were paying some pretty heavy hauling bills and getting rather indifferent service. I told him I was rather afraid of the maintenance. But I concluded to investigate, so I gathered 11 truck manufacturers' addresses from current advertisements and wrote to each of them a letter something like this:

"Gentlemen:—Can you give to me any information as to the maintenance of trucks in a business like ours?"

"My thought was," says Buckley, "that they could get an idea of the business from the letterhead, or they could ask if they wanted more particulars.

"We mailed the letters and waited. We had an idea when we should hear from them, but two days slipped past after that date and nothing happened. Then came a letter, thanking me for the inquiry and noting that a catalogue was being sent to me and on pages 24 and 25 I would find the specifications. I was not interested in specifications, did not understand them and so did not read them. Five such letters were received

but not a word indicating that I had asked what I thought was a definite question.

"After these five letters had been filed, the first salesman from a local dealer came. The first one to arrive was typical. He said he had called in response to the inquiry regarding the Sennett truck. Of course, I denied sending an inquiry as to this truck, as I was interested in maintenance. I had full confidence in the truck firms I had addressed. He showed me the card his salesmanager had given to him, but he had not seen my letter and quickly demonstrated that he had no information as to maintenance of his truck in a business like ours. Five such callers came and went. We had then given up hope.

"But late one afternoon I was informed that a Mr. O'Brien wanted to see me. I asked him in and a red-haired, freckled, pleasant lad came in. His clothes and shoes were dusty and he looked as if he had been working, but he had a smile and as he came into the room he said:

"Mr. Buckley, I am with the Runwell truck and I have been out on your shipping platform all day and I know some things about your business that I would like to tell you at any time that you can give me 20 minutes."

"This man knew something that I wanted to know and the question of giving him an audience was settled right then," said Buckley. "We sat down and he started to talk. Several 20 minutes had passed before I ceased asking questions. When he left, it was to write up the order I was to sign.

"To this day I do not know whether the trucks we bought of him have chain drive or full floating axles, but we are getting the transportation we wanted and Mr. O'Brien calls around once in a while to look over our shipping platform and to assure himself that our maintenance bills are what he said they would be."

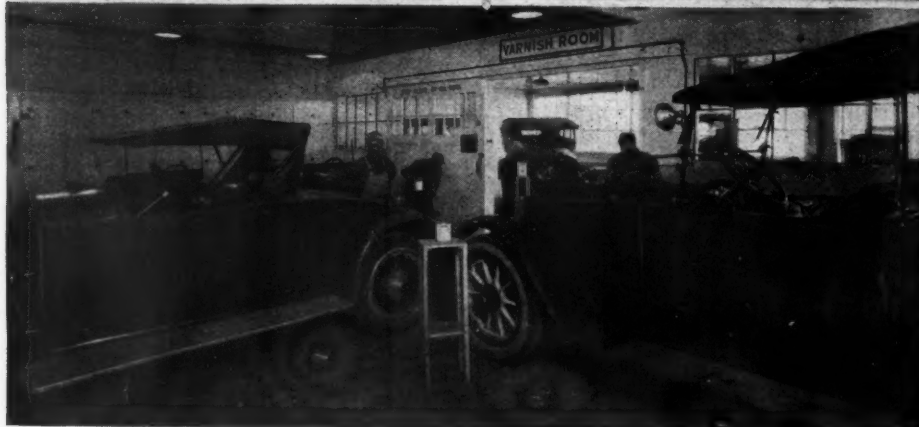
This story is told here merely to bring out the point that if a man wants to buy a truck and don't send you the order, he has some question in his mind. The man who sells him a truck will answer that question. Usually it is not a difficult one for the man who knows, the great problem is to find what the question is.

To a man with the proper sort of a transportation mind, a truck should not be harder to sell than a passenger car.



The exterior is clean and substantial looking

New Covey-Ballard Sales and Service Plant



The salesroom is spacious, light and attractive and the paint shop shown below must be good because it is patronized by the owners of high grade cars

Well Laid Out and Well Built, It Has Many Novel Features

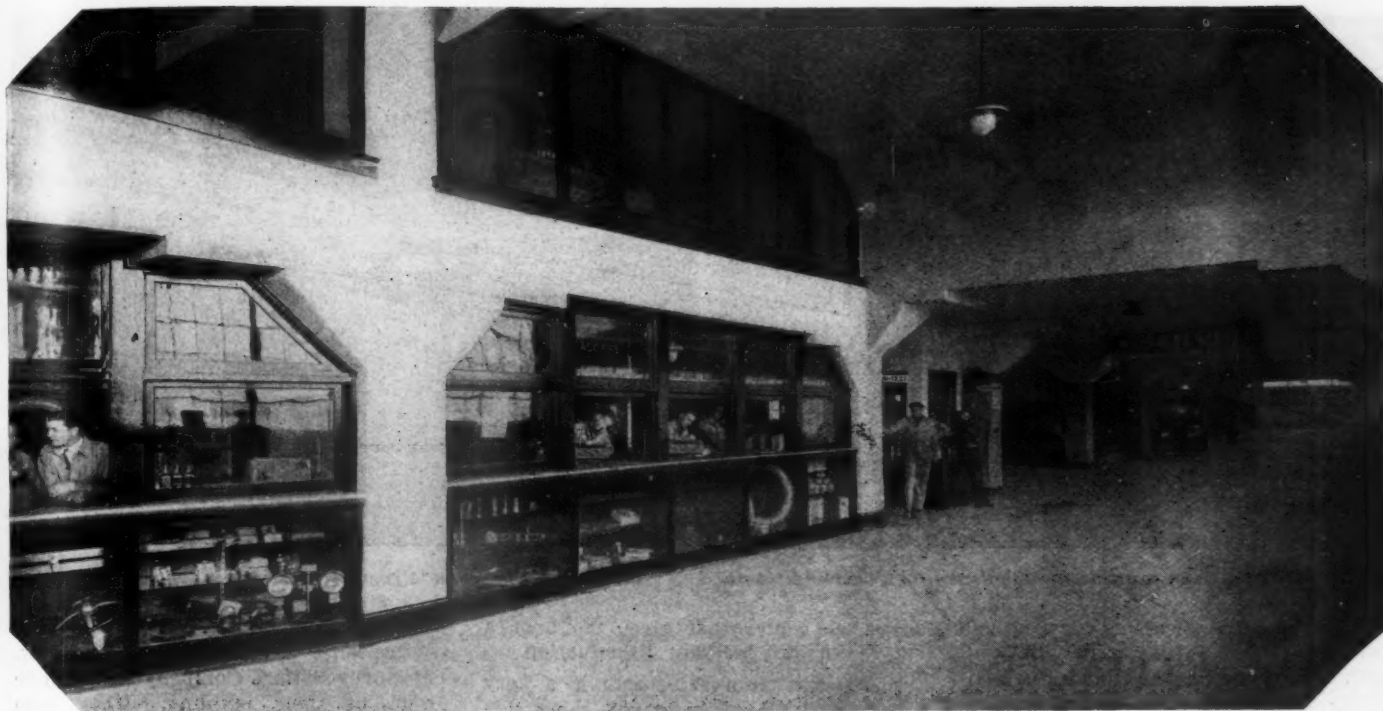
THE photographs shown on these pages will give the reader a fair idea of the extent and completeness of the new building recently opened by the Covey-Ballard Motor Company of Salt Lake City, Utah.

While a Salt Lake newspaper claims that this is the finest and largest automobile establishment in the west—if not in the entire country, we must take their western enthusiasm with a grain of salt, knowing their weakness, but nevertheless must give them credit for a very creditable and comprehensive layout.

Approaching the building from the southeast we see a plain but showy and substantial building of white enamel brick trimmed with mouldings of white terra cotta. At one side there is a job some 12 ft. wide and 40 or more feet deep, affording an entrance to the service department.

The car display room occupies the entire frontage to the depth of the service entrance and back of this are the offices, both on the ground floor and the mezzanine.

Entering the building we find ourselves in a broad clean hall probably 25 ft. wide which leads the entire length of the building. On the right there is an unbroken stretch of glass which



Just inside the service entrance

for Ford and Lincoln in Salt Lake City

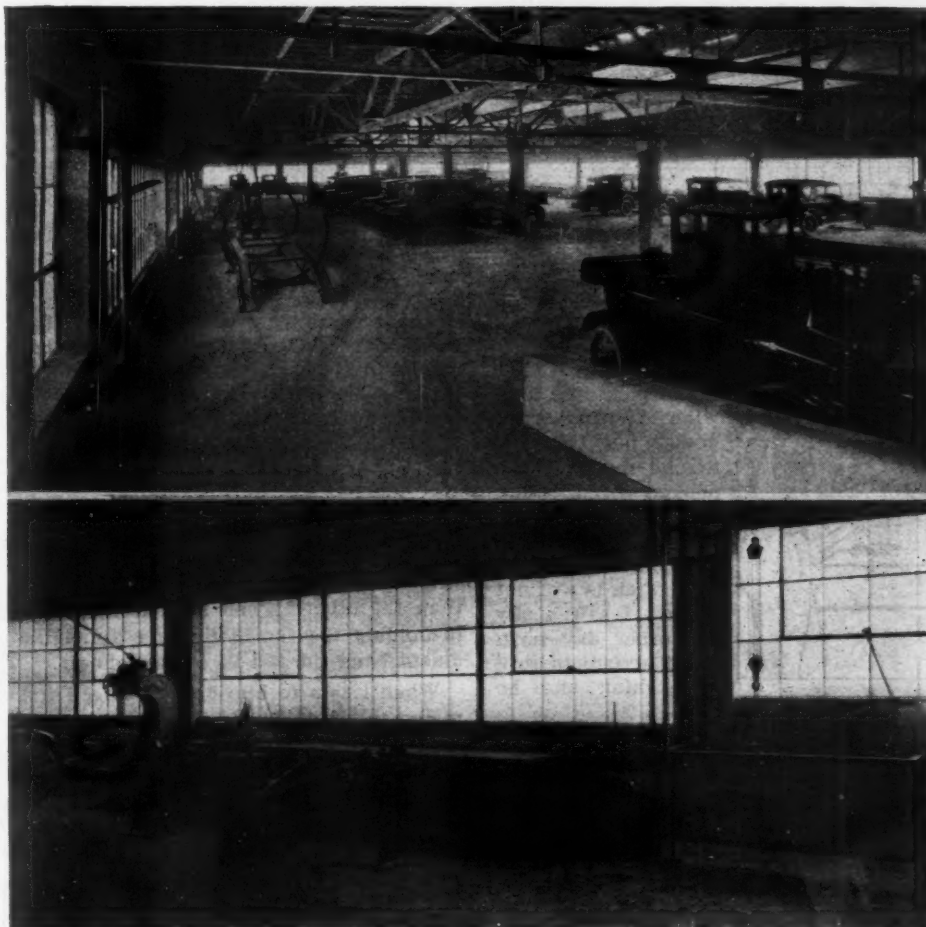
No Expense Was Spared to Produce a Result-Getting Plant

lights this side of the floor very effectively while on the left are the accessory and parts counters extending to the rear for a distance of approximately 40 ft. Still farther to the left, back of the counters, are the stockrooms. Beyond the counters are the gasoline and oil service pumps, conveniently located so that customers coming out may stop without being in the way of others either purchasing supplies or seeking service.

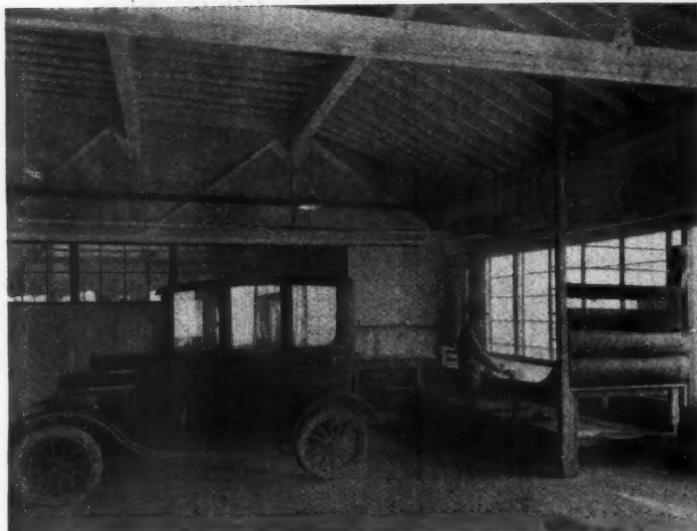
The accessory counters are especially well located to give the accessories good display to service and garage customers and to patrons who are waiting for little jobs of quick service. No one can enter any part of the building other than the salesrooms and office without passing their displays and there is no doubt but that they will be a lucrative source of revenue. The showcases are so arranged that the glass partitions above them may be closed and locked at night or whenever desirable.

Just beyond the pumps a sign and pointing hand indicates a left turn to the service department where trouble is diagnosed and minor adjustments made. Here also is ample storage space for finished jobs and jobs requiring more than quick service.

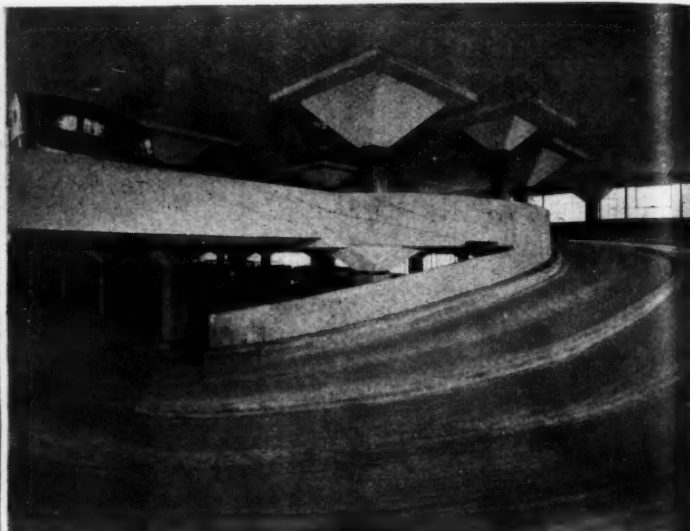
At the extreme rear end of the hall



The service station is roomy, lavishly lighted and well equipped with all known labor-saving devices



Much attention is given to trim and upholstery with startling results



The broad easy double ramp serves instead of an elevator

is a semi-circular two-way ramp which makes an easy swing across the full width of the building and lands the visitor on the second floor which, if he is a storage customer, is his destination.

If, however, he is bound for the repair shop his car makes a swing round and ascends another semi-circular ramp, directly above the first ramp, to the third floor where is found every labor saving device known to Ford or Lincoln service. Here he can have his tires changed, his car turned upside down, the battery rebuilt, the cylinders rebored, even the body rebuilt, upholstered and painted.

Besides an expanse of windows on four sides, unbroken except for narrow concrete piers, there is a row of skylights

down the center that gives the floor a very even and brilliant illumination.

Above the main salesroom is a very fine used car department and above this are the paint, trim and body departments where many cars other than Fords and Lincolns are rejuvenated.

On account of inserting a mezzanine floor back of the salesroom and to give the salesroom itself a higher ceiling, the front of the building is higher than the back, the third floor back striking midway between the used car floor and the paint shop floor. These differences are bridged by short ramps up and down from the main shop floor.

The building is all reinforced concrete and brick construction except the roof

which is a combination of steel and wood trusses with wood rafters and sheathing. The Covey-Ballard Company may well be proud of their building. They have shown much automobile sense in laying it out and it should be a great help to owners in the vicinity of the Great Salt Lake.

The Covey-Ballard Co., while handling the Ford line including Lincoln exclusively services all makes of cars; this is particularly the case in the refinishing department where even special bodies are built, trimmed and painted to meet the whims of the most whimsical customer whether he wants a Ford racing bug or a Pierce Arrow limousine trimmed in the most luxuriant fashion.

DAW'Z DIARY



July 12—Every time i go into a other fellows shop i try to pick up a idea wich i can bring home but Holy Smoke mostly i get hooked becuz they aint got no Ideas or if they has got one it is one of them kind wich is wot not to do. I saw a guy the other day tryin to fit a rist pin to a new shing and he sure made a mess of it.

I'm always making the Boss sore asking for new expanding reamers him sayin Fer the love of Mike wot do you do with all them reamers me not being abel to say except their wore out and i cant do good work without them but Gee Whiz my reamers look like a new pipe organ beside a couple of tin whistles if you was looking at this burds set of wrecks. Here he was tryin to ream out

a bronz bushing with a reamer that would only cut with one blade and that one so dull that it skipped part of the time.

When he diskovered that the reamer was just rubbing the metul down insted of cutting wot does he do but sharpen it on a big bumpy emry wheel which made it cut all right but you should a saw the graves and ridges on that bushing when he got thru and one end cut deeper than the other. Then he drives the pin in holding the rod in the vice and if he dident bend the rod ill eat my shoes.

When i sais to him dont you test that piston to see if its strait he sais naw its kind of loose anyway and thatel make it run quieter and the owner will think hes got a swell job me thinken Heck but wait a little wile and therel be swell graves in that cylinder i drather sell the guy a set of rings to make it quiet me making more and him getting a good job. Some burds think their clever when they slip something over on the customer but i halfto do the job rite.

Practical Perspective

"PRACTICAL Perspective" is the title given to a book recently published in a revised and enlarged form by the Norman W. Henley Publishing Co., 2 West 45th St., New York. The book is especially intended for mechanics.

The book contains practical examples of various classes of work and illustrations showing the use of isometric paper for lettering. The authors are Frank Richards and Fred H. Colvin. There is also a chapter on True Perspective. The chapter on True Perspective is intended only to serve as a very general and elementary guide to real perspective drawing. The price of the book is \$1.00.

BOOKLET GIVES ELEMENTARY INFORMATION ON STORAGE BATTERIES

A 48 page, paper covered booklet entitled "Strickland's Battery Guide" is being published by C. J. Strickland, 422 W. 29th St., Norfolk, Va. This booklet while primarily of interest to car owners gives elementary information which may also be of interest to mechanics and others who have not had an opportunity of studying the elementary nature of storage batteries. The price of the booklet is \$1.00.

The Case of Casey *by Herb Hyman*

THE CASE OF CASEY

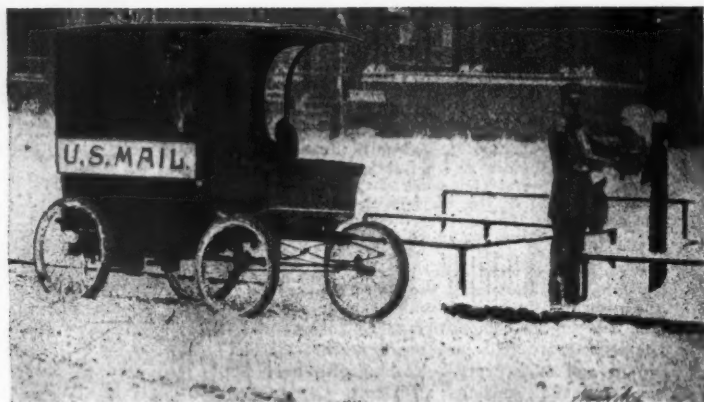
You've all heard the tale of Ben Adhem, of old,
Who saw in a dream an Angel, we're told,
Inscribing the names of leaders of men
On pages of gold with a platinum pen
In a book of achievement. And when he was done,
Ben Adhem inquired if his had been one
Of the names that the Angel had chosen to write
As he toiled o'er the entries he'd worked on that night.
And, Lo and Behold! though Abou never guessed,
'Twas his name he found that had led all the rest!
And now in our midst there's another Abou
Ben Adhem, I'm told—a modest chap, too,
Who in his own way, without fanfare or noise,
Has worked right along with the rest of the boys
In the Salesmanship Contest. And now that it's through,
We find his name entered like that of Abou
At the head of the list of the men who have won
The highest distinction for work that they've done.
And when we inquired to learn a bit more
Of this chap, unassuming, it listened like lore—
Inspiring as fiction; dramatic; intense—
So chock full of int'rest it's hard to commence.
But, if you will pardon my poor, halting meter,
I'll give you the low-down on this latest world-beater!
He's neither a German, a Finn, nor a Sioux;
Nor yet Scandinavian, Spaniard, or Jew;
He's not an Armenian, nor yet a Wop—
He hails from the land that's the home of the Cop!
His surname is Casey; the boys, just for fun,
Have nicknamed this high-powered Sun-of-Gun
"Big Battleship Casey." For, mark you, this chap
Has made every port that you'll find on the map.
On fifteen occasions he's gone clear around
This whole blooming sphere with the Navy, I found.
And though I suspicioned as much, what is more,
He's campaigned his way through every war
We've had since the Siege of Peking was begun,
And medals galore for brav'ry he's won.
The Philippine clash; Nicaraguan campaign,
Served only to add to his honors again,
And in the World War, with dangers so fraught,
We find Casey fighting as few others fought,
The whole Sixth Division, this hardy spalpeen,
Commanded in fighting the dread submarine.
And when it was over, his two thousand men
Paid Casey a tribute that proved once again
The stuff that this lad with the plain Irish name
Is made of. And that's what accounts for his fame.
A gold watch and chain was the token they gave
To Lieutenant Casey, their comrade so brave.
A married man,—Casey decided that he
Had done all he could for the nation's Nav-ee,
And though that he'd spend all the rest of his life
In devotion to fam'ly—his kids and his wife.
So way last December he started to find
A job that required a chap of his kind—
Who'd stick by the ship; had plenty of guts—
So he talked his way into a job with the Stutz!



Now Casey knew every nut, bolt and screw
In battleships, cruisers, and sub-chasers, too,
But of automobiles, he'll confess it, I ween,
About all he knew was they used gasoline!
But Casey, undaunted, was out for a job
With that unfalt'ring spirit that made every gob
In the whole blooming Sixth of the old U. S. N.
Admire his pluck. So it happened when
He asked for no saalry—a chance, that was all,
To stand by his work, or by it to fall,
A glint of assurance crept into his eye
That made Johnny Rodgers give Casey a try.
For John is no slouch, you'll confess, from his views;
His gamble was safe—he had nothing to lose;
He knew human nature, and that was enough
To persuade him that Casey had in him the stuff
That never says, "Die"—no matter what odds—
A trait to feel proud of, I'll say, by the gods!
For six weeks the "Battleship" plied here and there
On an unchartered course. It took courage for fair.
For never once was he within gun-shot of
What looked like an order, they tell me, by Jove!
Then came the Show; started off with a Bang!
(I'm getting excited; you'll pardon my slang!)
And into the thick of the fray Casey tore.
Here was his chance; he asked nothing more!
For prospects before like a Sherlock he'd searched.
Now by the literal thousands they lurched
In at the doors of the Show with the cry—
"O, please, Mr. Casey—O, please make us buy!"
So Casey, obliging, complied, you can bet.
And from all reports, he isn't through yet.
Casey's Fedora went into the ring.
For when we announced the Sales Contest this Spring,
And after it, Casey; primed to the hilt
For this highly competitive salesmanship tilt.
The score-board tells best the figure he cut.
Did he sell motor cars?—Nothing else but!
Roadsters and Tourings; Bearcats, Coupes—
His was the spirit that nothing could faze.
Weather reports were never his tune.
He left them to the Chicago Tribune!
Casey wrote orders!—Rain, shine, or snow;
And mostly no trades, I want you to know!
Then to make sure that there would be no pique,
Scored a hundred—six points the very last week!
So here's to you, Casey—salesman de luxe;
Talisman of the full order books;
Prince of good fellows who never say, "Die,"
But tackle their work with a smile in their eye
And that admirable, God-given faculty for
Making fast friends wherever they are!
Go to it, Casey! Let this be the start
Of a union of interests that nothing can part.
Unreef your sails; trim up your spars;
You get the orders—and we'll build the cars!



MOTOR AGE'S PICTURE PAGES



S. B. Betschel, president of S. F. Bowser & Co., speaking at the celebration marking the millionth pump produced. The pump and tank at Betschel's right are a replica of the first measuring pump ever built

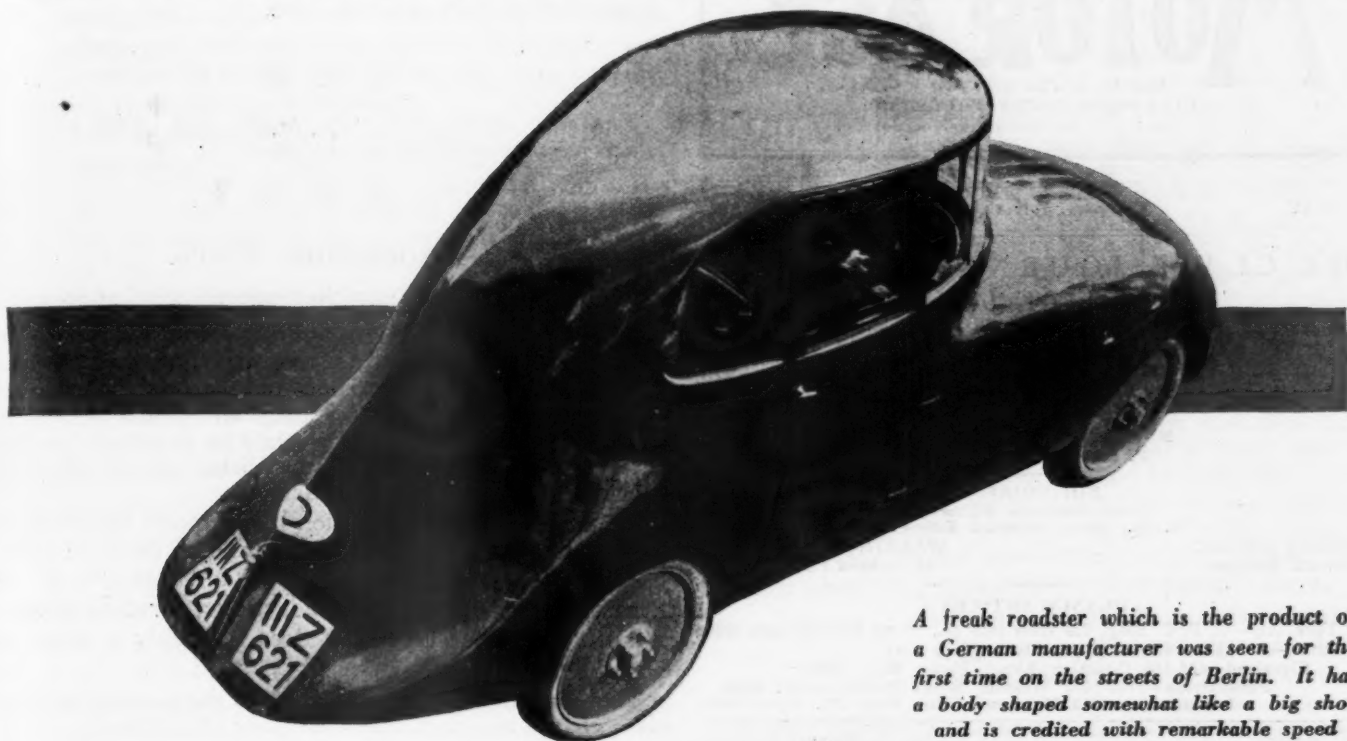


A "gasoline wagon" was used even as long as "23 years ago" for collecting the U. S. mail



This tractor was one of the exhibits of agricultural equipment at the Northern Fair, recently held at Kiel, Germany

OF AUTOMOTIVE INTEREST



A freak roadster which is the product of a German manufacturer was seen for the first time on the streets of Berlin. It has a body shaped somewhat like a big shoe and is credited with remarkable speed



F. J. Haynes, President of Dodge Bros., who recently announced that the sale of Dodge cars had averaged 5000 a week for the first five months of this year



The trailer at the right is the invention of Meyer Caplan, of Brooklyn, and is practically a collapsible home, which is attached to his car for motor touring. It contains sleeping quarters for four people, a clothing wardrobe, kitchen with stove for cooking and a table for eating. It is electrically wired and may be opened or closed in less than two minutes it is said. The addition of a phonograph gave the inventor and his family all the comforts they could wish on a recent transcontinental trip



MOTOR AGE

Reg. U. S. Pat. Off.
PUBLISHED EVERY THURSDAY
Copyright 1923 by The Class Journal Co.

Vol. XLIV

Thursday, July 12, 1923

No. 2

THE CLASS JOURNAL COMPANY

Horace M. Swetland, President
W. I. Ralph, Vice-President E. M. Corey, Treasurer
A. B. Swetland, General Manager
David Becroft, Directing Editor
Mallers Building, 59 East Madison Street, Chicago

BUSINESS DEPARTMENT
E. E. Haight, Manager

EDITORIAL

Clyde Jennings, Editor
B. M. Ikert, Technical Editor

DETROIT OFFICE
J. Edward Schipper

WASHINGTON OFFICE
26 Jackson Place, N. W.

BRANCH OFFICES

New York City—U. P. C. Bldg., 239 West 39th St., Phone Pennsylvania 0080
Detroit—317 Fort Street, West, Phone Main 1351
Cleveland—536-540 Guardian Bldg., Phone Main 6432
Philadelphia—1420-1422 Widener Bldg., Phone Locust 5189
Indianapolis—1212 Merchants Bank Bldg. Ph. Circle 8426

Cable Address.....Motage, Chicago
Long Distance Telephone.....Randolph 6960

SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....	\$3.00 per year
Canada.....	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies.....	35 cents

Subscriptions accepted only from the Automotive Trade

Owned by United Publishers Corporation, Address 239 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; A. C. Pearson, Treasurer; Fritz J. Frank, Secretary.
Entered as second-class matter Sept. 19, 1899, at the post-office at Chicago, Ill., under the Act of March 3, 1879.
Member of Associated Business Papers, Inc.
Member of the Audit Bureau of Circulations.

Neglected Opportunities

IN every community in this country there is a display of side curtains, seat covers and seat cushions before many of the motor car owners. The people making this display are not selling their wares especially cheap, because they have comparatively no opposition. These people are good merchandisers and they know best of all on what lines they can make a profit.

The above is a reference to the catalogues of the big mail order houses. Each of these catalogues devotes several pages to side curtains, tops and similar merchandise for automobiles, especially the lower priced lines that are in abundance in the farmers' hands.

It so happens that the making of curtains to refit a car is not a fine art. There are many men in the country, former harness makers, carriage trimmers and others who have seen their farmer trade slip into the discard, who can make these things. These men also can make drivers' cushions, radiator covers and similar articles. The stock and equipment needed is not expensive, the requirements of workmanship are not such that a craftsman cannot be developed. Each car owner carries his own patterns, unless he wants a special job which ought to carry a special price.

There will be a much greater future for the dealer who

keeps the cars he sells looking nice in any community than for the dealer who lets his cars look like road tramps. Also there will be a nice profit if he can sell a sufficient quantity of curtain and trim jobs.



The only service that pays profits and builds business is service that satisfies the customer.



Association Work

IT is interesting to note in trade association meetings the different phases of administration.

There is first of all the type of association wherein the secretary or manager is entirely subject to his board of directors and he hardly ventures an opinion as to what the association should do. Certainly he never, on his own part, tells anything of the accomplishments or otherwise promotes the work of the association.

Then there is the association that expects the manager to do things and to suggest things and to take the initiative. Very often these associations are managed by the secretary as though he was conducting a personal business and the good the association does is largely a reflection of the competency of the secretary.

There is still another type in which the salaried employee takes charge and runs the trade body almost to the exclusion of the members. He presides at meetings and very often serves as a shutoff valve for the entire membership. He makes the routine of his office greater than the voice of the membership. In this case, the good that an association does is certainly a reflection of the personal ability of the secretary.

There are a few associations that appear to have the right idea. In these associations there is a division of responsibility between the membership and the secretary. Everyone offers any suggestions that he may have, these are discussed and the secretary's opinion is sought. When a plan is adopted, it is the secretary's job to see that it is executed. The secretary may or may not originate, but he must execute and in the matter of execution he ranks above members whom he may call into help him at any time. Such an association is a trade democracy and certainly will do more than the other types.

This plan of association utilizes all sources of initiative, but places the responsibility for action.



Make your advertising tell why your cars are a good buy, not why you want to sell them.



Gasoline From Coal

FORD'S new industrial activity in the direction of low temperature distillation of coal is receiving commendation on all sides, although chemical engineers do not look on the scheme with optimism. The production of 10 gallons of gasoline from a ton of coal where before a gallon and a half of benzol was the limit of the motor fuel obtained, is certainly a goal worth working for.

It is pointed out that commercially the method has previously been a failure, and that in England plants erected for this purpose have been abandoned and dismantled.

On the other hand the fact that a \$500,000 plant is

already under construction at Walkerville, Ont., and that a \$750,000 plant for the same purpose is planned for River Rouge, Mich., points to something that the experts may have overlooked. Ford's activities have never before been looked upon with doubt for when it comes to a commercial venture his dollars seem to have the happy faculty of coming back with reinforcements.

The gain in motor fuel is accompanied by a reduction in gas by-products of from 10,000 or 12,000 feet as at present to some 6000 feet but it is claimed that with three gallons of creosote, twenty gallons of tar and heavy oil and a quantity of coke, that the process will show a saving of some \$2 per ton.

The motor fuel feature seems to be but a portion of the project, but a portion that interests us greatly. Ford is backing the scheme with his efforts and his millions. We bear the chemists no ill will, but we hope their prophecies go down under the weight of production efficiency.



Have you let your customers know your shop is well prepared to take care of their needs?



Value of Maintenance

IT is to be regretted that most automotive dealers in this country were enlisted in the business solely by the glittering promise of liberal profits in selling automobiles by the representation of the gross profit figures.

In nearly every case you find that the new dealer is attracted only by the lure of the sales profit, and that he considers the shop a necessary evil. We are confident that there will come a day when the dealer will take almost entirely the other view. He will view the car sales contract as something that serves mostly to put him in confidential touch with the car owners of the community and that he will look to his shop to pay a steady, all-year profit. Such a dealer will be the one who realizes that he should be friends with every owner of his make of car in the territory and each of these car owners is a potential customer for a greater profit during the life of his car than the car sale returned.

The maintenance departments of the car manufacturers have made a serious mistake in not more generally educating their dealers to the certainty of profits from the proper sort of a shop. When the dealer realizes that his shop is making steady profits, that he has a heavy percentage of his car owners as customers because he is treating them right, then will the fear of that devastating ghost—a buyer's strike—fail to dismay the automotive dealer, for he will know with a certainty that people will never quit using automobiles, even if they should quit buying for a year.



Ability to continue selling new cars is directly proportionate to keeping used car stock moving.



Shop Piece Work

RECENTLY a large maintenance shop in Chicago has put the piece-work into effect and the chief developments have been:

1. That the industrious, competent mechanics have made more money.

2. That a good many mechanics have been looking for other jobs, rather than work on their own responsibility.

The first net result of the piece-work was that one man refused to do a small job because, he said, that it would take him longer to gather up his tools than the time allowed for this job. It did not appear to this man that it was his own fault that his tools were scattered.

A fair proportion of the men employed in this shop have been entirely intolerant as to the piece-work schedule. Some rates they condemned as being too low, but the loudest objectors are not willing to discuss these rates with their foreman. They appear to think that the time as posted is the last word and the only thing to do is to accept these rates or quit.

In this particular case, no explanation of the piece-work plan was made to the men. They were told that the rates as offered were the best the office could figure from the job tickets at hand and that if mistakes had been made that they would be remedied, and that if there was not sufficient tool equipment, more would be supplied.

Certainly the men made a mistake in their attitude toward the piece-work plan, but apparently the employers made a mistake by not establishing proper relations with the men when the payment system was put into force.



A large volume of business is of no value unless it yields a fair profit.



Used Cars

NUMEROUS reports are coming from the dealer field, especially from these communities where there are competent trade organizations, that the used car inventories are not unseasonable and that the average price of the used car in the dealers' hands is much less than in previous years.

There is no question but that the dealers as a whole have made great progress in the used car problem and that the losses from this source are going to be far less to dealers' industry than in the two or three recent years, despite the fact that more used cars have been taken in by dealers.

This result has been brought about by discussion, education and co-operation. If a competent canvass could be made, we are quite sure that the improvement in conditions in cities where "plans" have been adopted would lead cities where no such effort has been made, but we are also quite sure that the machinery of the plan would not have as much to do with the improvement in these communities as the education derived from the discussion of the plan and of used cars generally.

The used car situation is not going to be cured by a patent medicine. The dealer must work it out for himself and win by sticking to the fundamentals of good merchandising. Chiefly are the age-old fundamentals:

Buy your merchandise right.

If it is not right, make it right.

Establish a character for your firm and your merchandise.

Never pass a loss on to a customer.

Any dealer who will stand by these fundamentals will not be much worried about used cars.

June Output 375,000 Cars and Trucks

Decline of Approximately 18,000 From May Figures

Truck Production on the Increase as Passenger Car Business Slows Down

NEW YORK, July 9—With an estimated output of 375,000 cars and trucks during June, the industry fell short by 18,000 of meeting the mark set in May, which was the peak month in the production history of the industry. Operations were sustained at high speed up to the third week when car manufacturers began to take steps to place their plants in condition for fall business. This necessitated closing some departments, although there was no actual cessation of activities.

What was experienced in the last week of June will become more pronounced this month and perhaps next as a greater number of plants make preparation for future operations, with a few of them closing down for a brief time. Such an inventory period as the industry is entering naturally is accompanied by curtailed operations which cannot be construed as a reflection of any alarming diminishing of interest on the part of prospective buyers throughout the country.

Buying interest is being maintained in a remarkable degree, although it continues uneven. Leading distributing centers report a volume of business extraordinary for this season of the year but few hold out hopes that the demand will be sustained at its present level. The holiday acted as a stimulus to sales the first part of this month but will be followed by a normal period of quiet in the retail field. This situation is to be expected and, coming with the temporary lull in manufacturing operations, will permit producers to catch up on back orders and meet the lessened current demand without overstocking dealers.

Deliveries of enclosed models have been slow for some time despite the straining of facilities in body making plants and orders have piled up as a result. Open car weather will go far toward depleting the stocks of that type which have accumulated in dealers' hands as the result of the unexpected demand for the closed car. Conditions in the used car market have improved, slow deliveries of new cars and more concentration laid on the merchandising of these vehicles being largely responsible for the slightly more wholesome but still unsatisfactory tone that has been apparent in the last few weeks.

The outlook for sales of motor vehicles in farm sections is brighter as the season advances. The comparative dullness in agricultural districts is due largely to the fact that the farmer is now chiefly concerned with his crops and is devoting

Motor Vehicle Output by Months

The following tables, prepared from the latest figures compiled by the National Automobile Chamber of Commerce, show the production of automobiles by months for the first six months of this year, compared with the corresponding period last year.

The figures for June are estimated.

	1923	1922
January	243,104	91,109
February	276,467	122,366
March	354,319	172,720
April	352,001	219,558
May	393,163	256,219
June	375,000	239,011

Cars and Trucks (1923)

	Cars	Trucks
January	223,706	19,398
February	254,650	21,817
March	319,638	34,681
April	344,474	37,527
May	350,180	42,983
June	331,000	44,000

little time to making purchases.

The decline in June output affected passenger cars entirely, estimates placing truck production for the month at 44,000, which is 1000 greater than in May and reflects the constantly improving tone in this branch of the industry.

743 N. A. D. A. MEMBERS

ST. LOUIS, July 10—There have been 55 withdrawals of members from the National Automobile Dealers' Assn. for all causes during the past year and in the month of June 49 new members were elected and 14 applications rejected. There are pending 49 applications for membership.

At the present time the Association has 743 members elected and in good standing.

HUDSON DEALERS MEET

ATLANTA, Ga., July 9—Hudson and Essex dealers and distributors from the various southeastern states held their annual sales and merchandising conference in Atlanta this month, the meeting being held under the direction of Harry G. Moock, general sales manager for the company. About 60 dealers were present, and among them all an optimistic spirit prevailed.

50 FORD DEALERS MEET

SAVANNAH, Ga., July 9—Ford dealers from 50 towns and cities in the Savannah territory attended the annual sales convention for the district the early part of July, and almost without exception stated their business the first six months of 1923 has proven by far the best in point of sales volume they have ever enjoyed.

Nine Out of 17 Starters Failed to Finish Grand Prix

Stuck Gas Tank Cap, Crankcase Smashed by Stone, and Inopportune Fuel Exhaustion Are Features

PARIS, July 6—(By cable)—Nine of the 17 starters in the French Grand Prix which was run at Tours, July 2, failed to finish the race, the total distance of which was 496½ miles over a course of 38 laps.

Sunbeam cars won first, second and fourth place and Friedrich in a Bugatti was third. The winning car was driven by Segrave, whose time was 6 hours, 35 minutes and 19.6 seconds, an average speed of just under 72 m.p.h.

Bordino in a Fiat led for eight laps, giving way to Lefevre in a Voisin, who in one sprint showed 122 m.p.h. for 300 yards. Lefevre was put out by the smashing of his crankcase by a stone thrown up from the road, giving the lead to Guinness, who in turn was deposed by Giaccone in a Fiat, who dropped after four laps because of carburetor trouble. Salamano in a Fiat led for 11 laps and with only three to go he ran out of gasoline, which cost him a possible victory. Divo then made his bid, but being unable to remove the cap of his gasoline tank had to run on his reserve, which forced him to stop every lap to take on fuel. This made it easy for Segrave to win.

Others who started but who did not finish were Thomas in a Delage; Rougier, Duray and Morel in Voisins; Guyot and Hemery in Rolland-Pilains, and de Viscaya, Cystria, and Marco in Bugattis.

In the small, light and heavy touring car events on the day before Lahms in a Mathis won the division for small cars, Cippot in a Peugeot the light car event and Boillot in a Peugeot the heavy touring car class.

2475 TRACTORS EXPORTED

WASHINGTON, July 7—Exports of American made tractors during the month of April totaled 2,473, having an aggregate value of \$1,100,565, while parts of tractors totaling 932,983 pounds, having a declared value of 226,482, were exported, according to figures compiled by the U. S. Bureau of Foreign and Domestic Commerce.

104,000 DODGES IN 6 MONTHS

DETROIT, July 7—For the first six months of 1923 Dodge Brothers sales totaled 104,000 cars, which compares with 85,890 in the last six months of 1922. This makes the total for the past twelve months 189,890 cars.

Readjustment Slows Up Production

Hupp Sales for Half Year Are 24,126—Exceed Quota

Original Schedule for Year Was
40,000—20,000 for Second
Half Year Planned

DETROIT, July 7—Hupp Motor Car Corp. sales in the first half of the year totaled 24,126, the second quarter being slightly in excess of the first. This total compares with 17,689 in the first half of last year and represents approximately 62 per cent of the output of 40,000 scheduled for this year. O. C. Hutchinson, general sales manager, said the company is outlining a schedule of 20,000 for the last six months.

Comparison of the first half year's business with that in other years shows it is 37 per cent in excess of the corresponding period last year; it is in excess of the entire year of 1920, and represents 75 per cent of the combined business for both 1920 and 1921, and 70 per cent of the total business in 1922.

President Charles D. Hastings said the outlook for summer and fall business in the south and middle west is exceptionally good. Business from these sections in the past few weeks and at the present time is larger than at any previous time. Distribution of cars in the large cities of the country and in many rural districts is behind orders, he said.

The factory investigations and reports from distributors throughout the territory indicate that business in the last six months of this year will be better than in the last half of 1922, Hastings said. Sales to farmers in the last half of the year will exceed those of any previous year if crops and prices continue to develop as now indicated, he declared.

Stewart-Warner Has Best Half Year—Orders Increase

CHICAGO, July 7—Encouraging prospects for the automotive industry for the next three months are found in the business reports of the Stewart-Warner Speedometer Corporation which manufactures vacuum tanks, speedometers and other devices for factory equipment and the replacement market.

This company reports that instead of cancellations of orders, as some forecasters had predicted, automobile manufacturers are actually increasing their orders for July, August and September delivery. Sales through branches and dealers throughout the country are reported good and maintained so evenly that so far as the sales department can discern all sections of the country are equally prosperous.

Business of the company in the first six months of this year was the greatest of any like period in its history, exceed-

Gasoline Tax Drives Motorists Over State Line

WASHINGTON, July 7—The Virginia State gasoline tax of 3 cents a gallon, effective July 1, has resulted in an influx of motorists of that state to the capital for their gasoline. Nearby garages and dealers in the state report that their gasoline sales have fallen off in some instances as much as 75 per cent.

A gasoline tax of 2 cents a gallon will become effective in the District the first of January.

ing by 63 per cent the sales in the first six months of 1922. The company reports that it has no bank loans and that its cash position is the best in the history of the corporation.

Springfield (Ill.) Dealers Invite Those of Nearby Towns

SPRINGFIELD, Ill., July 6—The Springfield Automobile Dealers Association has extended an invitation to the automotive dealers of Peoria and Decatur to be their guests on Monday, July 9. This will be a return courtesy following the recent trip of the Springfield dealers to Peoria. The Springfield dealers will give the visiting delegations a sightseeing trip to the points of interest and also the leading garages, and a dinner will follow at the St. Nicholas hotel with a program of talks by leading representatives of the industry in the three cities. There will be an interchange of ideas that, it is expected, will prove of value to the dealers of all three cities.

MORE GASOLINE IN RESERVE

WASHINGTON, July 7.—Consumption of gasoline during the month of May showed an increase of approximately 18 per cent over the gasoline consumption during May, 1922. Figures just compiled by the Department of Interior show that the May consumption this year was 582,554,181 gallons as compared with 499,542,343 gallons in May last year.

The figures show the nation's stock of gasoline on June 1 as 1,328,533,247 gallons, compared with stock on hand same date in 1922 of 856,607,102 gallons.

FORD WEEKLY PRODUCTION

DETROIT, July 7—Ford production in the week ending July 3 totaled 40,368 cars and trucks for domestic requirements. A new high daily mark was set June 30 with 6,884 cars and trucks, an increase of 67 over the best previous day, June 13. Tractor production during the week was 1,508 and Lincoln cars built totaled 171.

Preparation for New Models Halts Several Large Plants

High Schedules for July Maintained
by All Manufacturers in
Light Car Field

DETROIT, July 6—July's contribution to the production record of the year will lack a great deal of the impressiveness of the earlier months, but its failure may be charged almost entirely to the necessity for sacrifice that the remaining months of the year might be made stronger. Manufacturing in at least half a dozen of the largest plants in the industry will go by the boards in July in order that the plants may be made ready for production of new models which are due to be popping at intervals from the fifteenth of the month to Aug. 1.

In plants which are changing models there will be a closing out of materials which go into the present models and a general balancing of inventories so that an even start may be made with the new goods. Work will be somewhat intermittent owing to departments being tied up between the times the old material is run off and the new is being started, but there will be no general closing of plants, not even for inventory. The situation makes for a rather large falling off in output as compared with earlier months, but cannot be construed as indicating anything more than that new cars are coming out.

Taking Ford as a barometer of actual demand, that company declares that its July orders from dealers run in excess of 300,000, the same condition that has existed for the past three months. Ford, however, cannot be taken as an actual barometer for cars in any other than the low priced class, because of the large volume of business that cars in this class are getting from farm areas, whereas cars in the medium priced class generally are getting but a small percentage of business from farm districts. In the medium priced field the bulk of the buying is coming from the cities—a large percentage from industrial workers—and executives declare that demand is running close to the point of the earlier year peak.

Better known companies which are not changing models declare July business will approximate that of May and June. There are a number of companies whose cars are not among the leaders in their particular fields which have experienced rather severe curtailments in business in the past month and which are likely to meet with a continuance of poor business through July. For the most part these are cars which enjoy only a limited popularity normally, but which get into large

(Continued on next page)

Court Holds \$3,000,000 Bid for Willys-Overland Stock

**Decision on Sale of 739,860 Shares
Held by Willys Corporation
Due July 23**

NEW YORK, July 7—Whether or not the 739,860 shares of Willys-Overland stock held by the Willys Corp., which is in the hands of a receiver, shall be sold is still unsettled, despite the legal skirmishes which have taken place recently in Toledo and New York City. After two court sessions here this week the matter went over to July 23 at Buffalo, when the Federal court will reply to the three bids which have been filed.

This decision was reached by Judge Knox, who accepted a check for \$150,000 as a deposit on a bid of \$3,000,000 made by Thomas H. Tracy, representing Toledo interests. This offer is the same in amount as made previously by the merchandise and bank creditors' committee, differing from the other, which makes no provisions for the first preferred stockholders, in that Tracy agrees that all profits from marketing the stock in excess of \$2 would accrue to the first preferred stockholders; that the remainder was to be paid on the delivery of stock certificates and that the present relationship of John N. Willys with the Willys-Overland Co. be continued for a term of years.

A third bid of \$5 a share on 300,000 shares was made by two prominent Overland distributors, George W. Brown of Milwaukee and Guy O. Simons of Detroit, which was to be considered only in the event that the Tracy bid was not accepted, and with the understanding that the remaining 439,866 shares be withheld from the market for six months. The court asked for a deposit of \$15,000 on this bid which was given.

Because of the proviso that John N. Willys shall remain at the head of Overland affairs for a term of years, the Tracy bid is interpreted to mean that the Toledo interests really represent those who are fighting in behalf of the man who built up the Overland business and the postponement of the decision as to the sale of the stock is generally accepted as another John N. Willys victory, although in the court proceedings on Willys is in a neutral position.

While it has been said that the stock held by the Willys Corp. represents control of the Willys-Overland Co., yet such control could be gained only after a lengthy period, for before the common stock would have any say in the matter the claims of the holders of the first preferred stock would have to be satisfied and that is something that is controlled by the Willys-Overland executives.

WILSON RESIGNS FROM STUTZ

INDIANAPOLIS, July 9—Fred Wilson, who for several years has been sales manager of the Stutz Motor Car Co. of America, has resigned. He has not announced his plans for the future.

Automobiles Check Summer Cottage Renting

BOSTON, July 7—Sales of motor cars have made a serious dent in the renting of summer cottages along the Atlantic ocean, according to some of the real estate men. Nantasket Beach, one of the most famous stretches of waterfront just on the edge of Boston Harbor, had something like 1,800 unrented cottages a week ago. In other years the places were all gobbled up, practically by July 1, particularly those with a desirable location. Now it is possible to go along the beach and select any number of good places. The real estate men ascribe it to the great buying of motor cars this year more than anything else. Reasonable trips to Europe has been another factor. But the motor car is able to take the family to the beach three or four times a week with the long evening from daylight saving so it seems there is not the incentive to rent for a few months. Also the majority of the people could not afford both a car and beach cottage.

FRANKLIN SHIPMENTS BREAK RECORD

SYRACUSE, N. Y., July 3—Shipments of Franklin automobiles during the first six months of 1923 broke all records for the same period in previous years. A record total of 7,064 cars were shipped from January 1 to June 30. This amount, in comparison with the total for the first half of 1922, shows an increase of 63 per cent. The number of cars shipped to date represents more than 87 per cent of the total shipments made for the entire year of 1922.

(Continued from preceding page)

production from overflow business of the leaders.

Through the balance of the year there will be no overflow business for anyone, executives declare, but there will be plenty of good sound business for those companies which have built good will and have the sales organizations to go after it. Leading companies declare that with the start afforded in the first six months they will be easily in position to round out their yearly schedules in the remaining months which means close to capacity operation. Buick's schedule of 180,000 for the fiscal year ending this month has been greatly exceeded.

Approximate schedules for the month in the light car field show Ford will operate at 6,800 daily, Chevrolet 1,800, Star 300 and Gray 125. Among the leaders in the medium priced field not affected by model changes approximate schedules show Hudson in excess of 400 daily, Paige-Jewett 200, Maxwell-Chalmers 200, Rickenbacker 50. In the high priced field Cadillac's schedule in excess of 100 a day will be resumed following inventory now in progress; Packard is building about 100 daily, and Lincoln production is now about 35 daily.

Paige-Jewett June Sales by Occupations of Buyers

**15 Per Cent of Total of 5000 Went
to Foremen, Mechanics, Mill-
workers, Miners and Laborers**

DETROIT, July 5—Distribution of Paige and Jewett cars in June, according to occupation of the purchasers, shows the largest buying class to be foremen, mechanics, machinists, miners, mill-workers and laborers, these taking 15.5 per cent of the total sales which approximated 5,000 cars. The next buying class is merchants with 7.4 per cent, farmers ranking third with 6.6, the same percentage being achieved by sales in the building trades.

Each of these classes represents a considerable gain over sales in May, in which month the percentages for each of the classes in order was 10.3, 5.6, 5.7, and 4.7. In May the largest buying class was executives and manufacturers, these ranking fifth this month with 5 per cent as against 11.3. The remainder of the classifications in June is as follows:

Salesmen	3.7
Women	3.5
Real estate and insurance	3.
Clerks	2.8
Physicians	2.6
Engineers	2.5
Railroad employes	2.3
Garage and accessories	2.3
Hotel, restaurant proprietors	1.9
Government and municipal	1.8
Retired	1.8
Grocery and meats	1.3
Taxi and livery	1.1
Baker	1.
Oil	1.
Teachers	1.
Bankers	0.9
Barbers	0.9
Drugs	0.9
Printers and publishers	0.6
Undertakers	0.5
Miscellaneous	0.5
Occupation not given	16.

SEEK STOP LAW REPEAL

WASHINGTON, July 7—Repeal of the law in Virginia requiring motorists to come to a full stop at railroad crossings will be sought by the American Automobile Association, according to announcement made by M. O. Eldridge, National Executive Chairman.

The law which was passed to eliminate accidents, has been found to be impracticable the association declares and "has proven a fruitful source of revenue for fee-grabbing magistrates and constables and at one particular crossing has enabled footpads to hold up a number of motorists."

RUN 168 HOURS

SYRACUSE, N. Y., July 7—A Syracuse newspaper recently conducted an endurance run with a Rickenbacker car keeping it in constant operation for 168 hours, covering 4,754 miles. The average speed was 28.3 mile an hour and an average of 22.2 miles to the gallon of gasoline was made. No repairs to the mechanism or tires were required during the run.

Union Organ Approves of Ford and His Policies

WASHINGTON, July 9—Without referring to him as a possible candidate for President, the American Federation of Labor has put its stamp of approval on Henry Ford devoting an article to the Detroit automobile manufacturer in the July issue of the American Federationist, official organ of the A. F. of L.

"Ford stands in a class by himself—richest man in America, yet not disliked because of it, operating along lines developed in his own plant, not inviting union men to work for him but not conducting warfare against them," says the article.

After paying tribute to the Ford method of handling employees the article closes with the declaration that his policies and those of unionism agree.

SALESMEN CHARGED LICENSE FEE

RALIEGH, N. C., July 7—Not only automobile dealers but individual salesmen in their employ are liable for the \$5 state tax, according to a ruling of R. A. Doughton, state commissioner of revenue.

By his ruling the commissioner hopes to increase the revenue from automobile sales taxes from \$45,000, the amount received last year, to \$200,000, the amount estimated due the state.

The statute provides a \$500 manufacturer's tax for each make of car and that each salesman shall have a duplicate of the license, for which a fee of \$5 is charged. Under the ruling of the commissioner this tax applies not only to dealers but to each person employed as a salesman by the dealer.

Heretofore, the dealer alone has been required to pay the \$5 for duplicate license.

CLUB MEMBERS GET REDUCTIONS

HARTFORD, Conn., July 7—Through an arrangement with the Dixie Filling Stations, members of the Automobile Club of Hartford are able to secure a reduction of one cent on a gallon of gasoline and five cents on a quart of oil, the provision being that the member present his membership card. A further reduction is possible through the purchase of coupon books. This arrangement became effective July 1.

Each Dixie Filling Station likewise becomes a branch of the Automobile Club of Hartford in so far as the dissemination of road data is concerned. At each of the 42 stations operated by Dixie large road maps are displayed.

TO START FORD PLANT

NORFOLK, Va., July 7—The Ford Motor Co. announces its plan of building an assembling plant on 44 acres of land on the Southern branch of the Elizabeth river at this port, at a cost of \$2,000,000. Work on the project will start immediately, Edsel Ford announced on his arrival here.

Wills Ste. Claire Being Reorganized After Sale

C. H. Wills and Associates Buy Property for \$750,000 From Receiver—Production Continues

DETROIT, July 9—Reorganization of C. H. Wills & Co. to continue the manufacture of the Wills Ste. Claire car is under way, following sale of the company's property at Marysville, Mich., July 3 by the receiver.

The property was bought by C. H. Wills and associates, including most of the creditors, for \$750,000, their bid being the only one submitted. Kidder, Peabody & Co., Boston bankers, acted for the reorganization group in making the purchase and working out the reorganization plan.

Wills, who was president of the old company, and who is expected to head the new one, said that production will be continued on the present line of cars and that no price changes are contemplated. The factory has been in operation under the receiver since the receivership was instituted last December and according to Wills the total sales for the first half of this year were only slightly less than the total for the first six months of last year.

Throughout this period, Wills said, the dealer organization has remained almost intact and immediate steps will be taken to round it out wherever there are gaps.

The new company will be known as the Wills Ste. Claire Motor Co. Its authorized capitalization will be \$15,000,000 divided into \$5,000,000 each of prior preference, first preferred and second preferred stock, and 400,000 shares of common stock.

It is proposed to raise approximately \$3,000,000 in cash by having creditors and holders of first preferred stock in the old company subscribe for new prior preference stock to the extent of 30 per cent of their claims or holdings, receiving in addition larger amounts of second preferred stock. First preferred stock to the amount of approximately \$4,000,000 is to be issued to bank and merchandise creditors in the amount of their claims.

Arrangements are said to have been made to sell 300,000 shares of the common stock and enough of the prior preference and second preferred to net \$1,925,000.

The personnel of the new company will be announced when the legal formalities of the new incorporation are completed.

CHINESE GUESTS OF DURANT

NEW YORK, July 9—As guests of the Durant Motors, Inc., 100 members of the Chinese Merchants' Association of New York, visited the corporation's huge plant at Elizabeth, N. J., last Friday. Nearly all of the Chinese are "Durant Partners," holding stock not only in the automobile making subsidiaries but also stockholders in the new Durant bank.

Sells Car to Replace Buggy He Sold 15 Years Ago

LINCOLN, Ill., July 7—"George, the next time I sell you a vehicle it'll be a motor car," Lark Wasson, of the Wasson Company, Overland dealers, told George Urquhart, 15 years ago when he delivered one of his last buggies in stock. Wasson recalled the conversation this week when he delivered an Overland touring car to the Urquhart farm, and the buggy, which gave rise to the prediction, was moved out of the barn to make way for the automobile.

DES MOINES MOTOR MEN PICNIC

DES MOINES, Ia., July 9—Friday the thirteenth means nothing to the motor trades men of Des Moines. On that day, automobile men will turn the key in the door at noon and parade to the state fair grounds for the annual motor trades picnic.

Salesmen who have parched their throats these hot July days in extolling the merits of automobiles, piston rings, carbureters, wheel bases and what not, will forget "shop talk" and enter into keen competition in contests of capacity and skill. Watermelon eating contests, boxing matches, foot races, an automobile obstacle race and many other items of entertainment have been arranged for the amusement of Motor Trades men and their families.

NEW BAY STATE FACTORY

WORCESTER, Mass., July 9—The R. H. Long Motor Co. of Framingham has bought the large structure erected here some time ago on Millbrook street for the manufacture of shoes by the R. H. Long Co. The land and buildings are assessed for \$870,000, and were erected before Long became a motor manufacturer. Just before they were finished Long planned to make both shoes and motor cars, or motor bodies, here. Work will begin right away so that production of the Bay State car now being made in Framingham may be increased.

MOON SALES INCREASE

ST. LOUIS, July 9—Sales of Moon cars for the first six months of 1923 ran 200 per cent ahead of sales for the same period last year, according to F. H. Rengers, sales manager of the Moon Motor Car Co.

The Moon company reports that from 60 to 65 per cent of its sales are on enclosed models, and even with increased facilities the company is behind in deliveries of those models.

PEERLESS SCHEDULE NOT CUT

CLEVELAND, July 6—Announcement is made by officials of the Peerless Truck & Motor Corp. that the schedule for the twelve months has not been cut and will not be cut, although July probably will be 20 per cent below May and June.

General Motors June Sales Were 68,000 Cars and Trucks

**This Compares With 75,000 in Each
of Two Preceding Months and
71,000 in March**

NEW YORK, July 9—Combined sales in June of the American and Canadian car manufacturing divisions of General Motors totaled 68,000 cars and trucks, according to preliminary estimates.

This compares with preceding months and further with corresponding months of a year ago as follows:

	1923	1922
January	49,162	16,058
February	55,458	20,869
March	71,698	34,082
April	75,856	40,474
May	75,419	46,736
June	68,000	48,541
July		33,772
August		42,840
September		35,443
October		40,815
November		50,232
December		46,871

*This preliminary figure includes Buick, Cadillac, Chevrolet, Oakland, Oldsmobile passenger and commercial cars and GMC trucks.

Strong Demand in Central Ohio for Low Priced Cars

COLUMBUS, O., July 7—While there has been a falling off in the demand for some lines of cars, the demand as a whole in central Ohio territory is holding up well. Dealers in cars ranging up to \$800 are experiencing a strong demand and in most cases it is a question of making deliveries rather than getting sales. In cars ranging from \$800 to \$1800 there is a good demand but the strength of earlier in the season is lacking. But there is no accumulation of cars of that class especially and dealers are generally satisfied with conditions.

In cars above the \$1800 price the demand is fair and sales are good as a rule. Used cars sales are not as active as formerly and there is quite an accumulation of used cars, especially of the less desirable makes. Farmers are expecting a good harvest and are looking around to make purchases. In fact, quite a few deals have been closed for delivery after harvest. Crop conditions in central Ohio are generally good, although the season is somewhat later than usual. The Ford weekly purchase plan is working well according to dealers in Columbus.

PEAK PASSED IN CALIFORNIA

SAN FRANCISCO, July 9—The peak of the retail automobile sales seems to have been passed here with the passing of May for all of northern California. June shows a drop of about 35 per cent in the wholesale business under that of May, but city business on popular lines is about equal to that of the preceding month. The dealers interpret this to mean that the farmers are not buying cars, that is to say, the agricultural population is not building up the trade as it did in April and May.

The crop production outlook is splendid, but prices and sales are not so good as to warrant the farmers in putting much money into passenger cars. More of them are having their old cars reconditioned, and this has, to some extent, strengthened the business of the repair shops and garages in the smaller cities and towns. Cars selling below \$1,000 are going well, and those selling below \$750 apparently are maintaining the May average. Retail sales of high-priced cars are very slow, and the used car situation is getting worse, rather than better, according to local dealers.

City Makes License Plate Advertise Itself

MARTINSBURG, W. Va., July 9—

For the first time in the history of the State, automobile licenses have been adopted as a medium of advertising. This city, in the heart of the apple belt, is advertising its product by having its city automobile licenses, required on all cars operated and owned within the city, made in the form of an apple, with the word "Martinsburg," the year and the number stamped on the face of the license. The city license is then attached to the state license.

Sports Enliven Outing of Philadelphia Sales Managers

PHILADELPHIA, July 6—The salesmanagers' division of the Philadelphia Automobile Trade Association held its first annual outing at the North Hills Country Club, Edgehill, more than 300 members and guests being in attendance. There were baseball games, a golf contest, a tug of war and several foot races. The married men defeated the bachelors in both ball games. Connie Mack arrived at the club, looked at the first game for a few moments and then went away to play golf.

Nearly sixty men took part in the golf tournament for 18 holes, won by A. C. Maucher, with a gross score of 97, and E. A. Dougherty, with a handicap of 29, made a score of 72. The winners received gold medals and cash prizes. C. D. Robinson won a putting contest in which he holed the ball in two putts, three consecutive times. A. Talheimer won the driving contest and G. L. Roat made the second longest drive. The wholesale managers' team won the tug of war. F. J. Graham handily won the 100-yards' dash, winning a cash prize. A banquet on the clubhouse piazza brought the outing to an end.

WASHINGTON (D. C.) OUTING

WASHINGTON, July 6—The Washington Automotive Trade Association will hold its annual outing on July 12. Committee in charge of the affair is composed of L. S. Julien, Edward Jones, Neil Walcott and Si Grogan.

Plans Made for 24 District Organizations of N. A. D. A.

**Each Division Would Elect Member
of Enlarged Board of
Directors**

ST. LOUIS, July 10—To conform with the expressed opinion of members of the National Automobile Dealers' Association made at the director's meeting in Chicago on Jan. 30 of this year, a plan of reorganization of the association has been promulgated and a bulletin issued outlining the plan which will be submitted to the 1924 convention in January of next year for ratification.

Under the new plan the country has been divided into 24 districts, each with a representative on the board of directors, and the president of the association will be elected by the directors instead of the members as heretofore. The executive committee will be increased from 3 to 5 members.

The re-districting of the association is suggested as follows:

First District—Massachusetts, Maine, Vermont and New Hampshire.

Second District—Connecticut and Rhode Island.

Third District—New York City to Albany (inclusive) and New Jersey.

Fourth District—New York State (Exclusive of territory between New York City and Albany).

Fifth District—Eastern Pennsylvania, Delaware and Maryland.

Sixth District—District of Columbia, Virginia and North and South Carolina.

Seventh District—Georgia, Florida, Alabama and Tennessee.

Eighth District—Western Pennsylvania and West Virginia.

Ninth District—Northern Ohio.

Tenth District—Southern Ohio and Kentucky.

Eleventh District—Minnesota, North Dakota, South Dakota and Montana.

Twelfth District—Wisconsin.

Thirteenth District—Michigan.

Fourteenth District—Kansas and Nebraska (and including Kansas City, Mo.).

Fifteenth District—Illinois.

Sixteenth District—Indiana.

Seventeenth District—Missouri and Iowa.

Eighteenth District—Oklahoma, Arkansas, Louisiana and Mississippi.

Nineteenth District—Texas.

Twentieth District—Southern California and Arizona.

Twenty-first District—Northern California and Nevada.

Twenty-second District—Washington and Idaho.

Twenty-third District—Colorado, Wyoming and New Mexico.

Twenty-fourth District—Oregon.

TIRE PRICES GUARANTEED

NEW YORK, July 7—The Kelly-Springfield Tire Co. has guaranteed tire prices to dealers against further reductions until Oct. 10.

Bonus to Soldiers Boosts Sales in Central Illinois

**Dealers Surprised at Rush to Buy
Cars—Most Orders for Vehicles
Costing Less Than \$1000**

BLOOMINGTON, Ill., July 9—Central Illinois automobile dealers know that there has been a bonus payment to the service men of this state. With the first arrival of the welcome checks from Springfield, there was an exodus towards the sales agencies and a signing of contracts. In most instances, the bonus check was applied upon the payment of cars under \$1,000. Those selling for more than that figure were eyed askance. As the bonus checks average less than \$300, most of the soldiers felt that it would be unwise to risk the loss of a car through inability to meet the subsequent payments and preferred to feel safe with a car that was within their reach. For this reason, cars that ranged around \$500 to \$800, secured most of the buyers among the service men, while quite a number invested their cash in a good second hand car.

It is generally believed here that more of the bonus money went into automobiles than in any other single field. Those ambitious to own homes felt that the bonus check was too small to buy even a lot and decided upon the motor car instead. It is believed that a large proportion of the service men who deposited the check in a bank as a nest egg for some future investment, will sooner or later follow the example of a large proportion of their comrades and order an automobile.

Central Illinois dealers who handle the lower priced cars had looked forward to many orders when the bonus checks arrived, but they were unprepared for the stampede that came and it will require some time to secure sufficient cars to fill all of the orders that have been taken.

Vane Confers With Dealers in West on Freight Rates

ST. LOUIS, July 7—C. A. Vane, General Manager of N. A. D. A. who has been in Los Angeles attending meetings of dealers there, will remain on the coast to conduct a series of conferences with traffic men of various industries, automobile dealers and association officials with a view to adopting a plan to present to the railroads in an effort to get an adjustment of freight rates, which are reported as very high in that part of the country. These meetings will be held in Los Angeles and San Francisco in July.

BOSTON DEALERS ELECT OFFICERS

BOSTON, July 7—At the annual meeting of the Boston Automobile Dealers Association the election of officers was held, and tentative plans arranged for the 1924 automobile show. John H. MacAlman, president for a number of years, was re-elected. He is the Stearns Knight

distributor. J. W. Maguire, Pierce Arrow dealer, had no opposition for vice president. John W. Bowman, former Daniels Eight dealer, who went out of the motor trade to take charge of the Used Car Statistical Bureau, was elected treasurer. Chester I. Campbell was re-elected secretary and show manager.

The directors selected include the officers with John H. Johnson, of Buick; F. A. Hinchcliffe, of Jordan; Charles E. Fary, Maxwell-Chalmers; C. P. Rockwell, Nash and La Fayette; Joseph S. Donovan, Studebaker; George B. Kimball, Hudson-Essex; A. L. Danforth, Cadillac, and W. C. Sills, Chevrolet.

Suit for Receiver Filed Against National Motors

INDIANAPOLIS, July 7—Suit for receivership was filed here yesterday against the National Motors Corp. and the old National Motor Car & Vehicle Corp., now a part of the first named concern.

The suit was filed by W. H. Duval & Sons of New York and is based on a judgment for \$10,987 obtained in April in New York on account of material sold to the old National company. A hearing was set for July 10.

George M. Dickson, vice president of the National Motors and manager of the Indianapolis plant, said the judgment against the company grew out of a disputed claim for velours and trimming materials bought in 1920 but not accepted upon delivery because the company was not satisfied with the quality. The materials were then stored in Indianapolis and suit was started in New York where judgment was obtained.

SUIT AGAINST KENTUCKY WAGON

LOUISVILLE, Ky., July 7—An involuntary petition in bankruptcy against the Kentucky Wagon Manufacturing Co. was filed today in the United States District Court. The petitioning creditors are Woodruff-Powell Lumber Co. of Indiana, with claims of \$1,056.54; the Electro-Chemical Engraving Co. \$1,202.52, and the Milliken Battery Service Co., \$118.48.

The Kentucky Wagon Manufacturing Co. is one of the units of the National Motors Corp.

NORTHWEST IOWA BUSINESS BOOMING

SIOUX CITY, Ia., July 9—Automotive dealers in northwest Iowa are enjoying unprecedented prosperity. The period of business depression, which struck Sioux City and adjoining territory with greater force than any other section of the state, is lifting and automobile dealers are enjoying their delayed business.

IOWA STATE FAIR RACES

DES MOINES, Ia., July 9—Two days of automobile racing will be the headline attraction at the Iowa State Fair this year, according to the schedule of events recently announced by Secretary A. R. Corey. Race days this year will be Friday, Aug. 24, and Friday, Aug. 31.

Illinois Speed Limit Raised to 35 Miles Under New Law

**Trucks Must Be Geared or Equipped
So They Cannot Exceed
Maximum Rate**

SPRINGFIELD, Ill., July 7—New and in some cases radically changed laws enacted at the last general assembly became effective in this state July 1 and Secretary of State Louis L. Emmerson immediately launched a campaign for their enforcement. Speed limit on country roads has been raised from 30 to 35 miles an hour, and all headlights must be dimmed within 250 feet of another automobile whether they are equipped with anti-glare lenses or not.

Dealers' licenses are restricted to cars used for sales and demonstration purposes only; every owner must apply for a license for his car within 24 hours of the time the car came into his possession; reassignment of numbers may be applied for within 30 days after Jan. 1 instead of 20 days; the garage record of machines for rent, storage, delivery or repair is abolished.

All bus and freight lines are required to pay an additional license fee of \$1 a day for each 100 pounds of gross weight of vehicle and load. Motor trucks cannot be geared to a speed beyond the legal limit, or if so, must be equipped with devices to prevent exceeding that speed. Police and fire department cars are exempt from this rule. Any driver who leaves the scene of an accident in which his car was involved without reporting his name and number is liable to \$200 fine.

Large Attendance Promised For Secretaries' Meeting

ST. LOUIS, July 7—Headquarters of the N. A. D. A. has been advised from several sources that there will be a large attendance at the national conference of association secretaries at the Drake Hotel in Chicago, July 23 and 24.

NEW COMPANY FOR BRUNSWICK

CHICAGO, July 7—The Brunswick-Balke-Collender Co., manufacturer of billiard equipment, phonographs and records, and Brunswick tires, is organizing a subsidiary company to handle its tire business. The subsidiary probably will be known as the Brunswick Tire Co., but details of capitalization and organization have not been made public.

Officials of the company state that the subsidiary will be owned wholly by the Brunswick-Balke-Collender company and that its personnel will be virtually the same as that of the parent corporation. The sales organization, however, will be distinct from that of the older company. The manufacture and distribution of Brunswick tires will be continued by the new company, it is stated.

Massachusetts Classifies Dealers Under License Law

Also Enacts Measure Enabling Officers to Search Establishments of Used Car Men

BOSTON, July 10—Massachusetts has made changes and passed new measures totaling seven in connection with its motor laws this year. Now the Secretary of State has compiled them. Of the seven, six will become operative during the year, and the other, for a gasoline tax of two cents a gallon, will wait until the people have passed upon it through a referendum.

The first measure passed was signed in February and became a law in May clearing up the obscure points regarding dealer licenses. A question came up early in the year regarding the definition of certain classes of dealers, and it was found that the law was indefinite in distinguishing each class. Now it is remedied by having regular dealers in one class; those specializing in used cars solely in another class under a used car dealer's license, and others who buy used cars to rebuild or sell parts, allowed to operate under a motor vehicle junk license.

The next measure was passed to allow the officers and men attached to the Department of Public Safety, that includes the State Constabulary, the right to enter the premises of licensed dealers in second hand cars, for the purpose of checking up on the cars. This was passed as an emergency measure and went into effect April 7 to enable the State officials the same privilege as municipal officers in their efforts to trace stolen cars.

Following that the legislature passed a permissive parking light bill.

One of the changes that has some teeth in it is Chapter 347 to penalize the removal or concealment of automobiles to defraud the insurance companies. Any person convicted of this crime cannot escape with a fine. The penalty is not less than one year in jail nor more than five years in State prison.

Then there was the change made in the non-resident law. This aims to allow Massachusetts to reach the transgressor of her laws, if he goes away. The new section provides that for non-resident to accept the privileges of the State laws shall be deemed equivalent to an appointment by him of the registrar as his attorney upon whom may be served all lawful processes growing out of an accident or collision.

It goes on to say that said service shall be deemed as legal as if served upon him personally. Notice must be sent by registered mail to the defendant by the plaintiff, and the return receipt must be attached to the writ and declaration. The judge may allow continuances of a reasonable time for a defendant to appear to contest the case. However, if he does not show up the plaintiff may go ahead, but to collect judgment may not be so easy. The law will become effective about Aug. 15.

REPUBLIC TRUCK ENLARGES SALES

DETROIT, July 9—Republic Motor Truck Co., Inc., is working on a schedule of 250 trucks in July and August with prospects of continuing at this figure or in excess of it in the later months of the year. Business is good in all models, according to O. W. Hayes, president and general manager, with the majority of sales, however, in the ton, ton and half and two and half-ton models.

The company will do away with all branches under present sales plans, and will sell its product through distributors. The company is making a drive for dealers in which Hayes declared it is meeting with great success, as dealers apparently have become convinced that there is good opportunity for profits in truck business now, and that there is good prospect of the market continuing.

In the larger cities the company will seek for distribution through dealers specializing in the truck field but in the smaller cities will sign contracts with car dealers who are equipped to handle truck sales.

DEALERS COLLECT GAS TAX

HARRISBURG, Pa., July 9—The two-cents a gallon gasoline tax rate under the terms of the new Henderson fuel oil tax law, is now effective throughout the State. The tax formerly was one cent. It is expected to add \$6,000,000 revenue annually to the State treasury. All dealers must register with the auditor-general and those who do not are liable to \$1,000 fine. The cent additional is an emergency tax for the two-year period. The tax is collectible from the consumer by the dealer and reports are to be made quarterly, instead of monthly as heretofore, to the State treasurer.

R. S. WILSON HONORED

DETROIT, July 9—Executives of the Maxwell-Chalmers organization recently gave a dinner at the Detroit Athletic Club in honor of William Robert Wilson, marking the completion of his second year as president of the company. John J. Plath, director of sales for Maxwell, acted as toastmaster. Addresses were made by W. Ledyard Mitchell, Arthur E. Barker and B. E. Hutchinson, vice presidents, and by Wilson.

BODY PLANT BURNS

DALLAS, Tex., July 9—The plant of the Texas Wheel and Body Works of Dallas, was destroyed by fire recently. The loss to the company was estimated at \$100,000. More than a score of completed bodies were burned. The machinery and equipment of the plant were badly damaged. The plant was partially insured. It is understood the plant will be rebuilt.

WON'T FINE JAYWALKERS

BUFFALO, N. Y., July 7—By a vote of two to one, with two members absent, the Buffalo city commission opposed an ordinance which would have made jaywalking punishable by a fine. Mayor Schwab voted for the proposal.

Franklin Awards Prizes to Winners in Sales Contest

Los Angeles Man Makes Best Showing—Chicago Dealer Wins Second Place

SYRACUSE, N. Y., July 9—Winners in the sales championship contest for the first six months of this year conducted by the Franklin Automobile Co., have just been announced. Dealers were divided into seven groups, according to population and estimated buying power of their territories, and awards were made to the winner of first and second place in each group. First prize was a full page newspaper advertisement sign by H. H. Franklin, president of the company, congratulating the winner, and second prize was similar half-page advertisement.

Winners of the prizes in the various groups were as follows:

Group A, including the larger cities of the United States, first prize, Halph Hamlin, Inc., Los Angeles; second prize, Franklin-Butler Motors, Inc., Chicago.

Group B, first, Portland, Ore.; second, Columbus, O.

Group C, first, Syracuse, N. Y.; second, Seattle, Wash.

Group D, first, Greenville, S. C.; second, Pendleton, Ore.

Group E, first, Schenectady, N. Y.; second, Binghamton, N. Y.

Group F, first, Greensboro, N. C.; second, Geneva, N. Y.

Group G, first, Sioux Falls, S. D.; second, Miami, Fla.

RACE AT LOUISVILLE

LOUISVILLE, Ky., July 7—Jake Johnson of Owensboro won the 50-mile automobile race for a \$1,000 purse at the Owensboro Fairgrounds July 4. Harry Milton, who was leading with only two laps to go when battery trouble developed, finished second, and Allan Sebolt of Louisville was third. There were twelve starters. Lum Mullican crashed through the fence into the crowd on a turn, but no one was injured.

LOYALTY CLUB GIFT

BETTENDORF, Ia., July 7—Forty-five members of the Bettendorf Co. Loyalty club presented J. W. Bettendorf, president of the big plant, with a silver loving cup 16 inches high, at a social event at the Bettendorf home July 3. Membership in the club is limited to men employed 15 years or longer. W. G. Wilkens, club president, made the presentation.

20,196 CARS FERRIED IN NIGHT

PHILADELPHIA, July 9—All records for transporting automobiles from Camden to this city on the ferries recently were broken; there being in one night, or between 4 p.m. and 1 a.m., 20,196 cars, or an increase of 50 per cent over the same day last year.

Dealers Are Designated As "Automotive Merchants"

Classification at Charlotte, N. C., Substitutes One Business Tax for Multitude of Items

CHARLOTTE, N. C., July 7—An advance for the automotive industry of this city was made when city commissioners agreed to list the trade in the new tax ordinance as "automotive merchants" and allowing a single tax to take the place of the former multitude of taxes for individual items.

Heretofore dealers in automobiles and various kinds of accessories and automobile parts were charged for different items resulting oftentimes in one dealer paying four or five different taxes.

In the 1923 ordinance dealers in new and second hand automobiles, trucks, tractors, trailers, parts, accessories, batteries, body builders, painting, tops and upholstering, tires and tubes, storage, garage, tire repairing, gasoline, car washing, any or all of the above mentioned, for each store or place of business, will be charged the following tax on the annual gross sales: minimum, \$25; from \$50,000 to \$100,000, 50 cents per 1,000; from \$100,000 to \$200,000, 35 cents per 1,000; from \$200,000 to \$400,000, 25 cents per 1,000; in excess of \$400,000 the tax shall be 20 cents per \$1,000 but the minimum shall not exceed \$300. Each sidewalk gasoline pump will be taxed \$25 in addition.

The change in the ordinance was made after a delegation from the Charlotte Automotive Trade Association appeared before city commissioners with request for innovation.

Nash Turns Out 32,243 Cars in First 6 Months of 1923

KENOSHA, Wis., July 6—Total production of passenger cars by the Nash Motors Co. for the first six months of this year was 32,243 vehicles. This exceeded the production for the corresponding period of last year by 11,783.

Shipments in June were 6135 as compared with 6208 in May. The company attributes the greater number in May to the fact that there was one-half day more working time in that month than in June. June shipments exceeded those of the corresponding month a year ago by 1334 cars.

A. A. A. Helps Tourists Take Their Cars to Europe

WASHINGTON, July 9—The American Automobile Association announces that it has succeeded in greatly simplifying the procedure by which American tourists may take their automobiles to Europe with them. Upon depositing with the A. A. A. at its New York headquarters an amount sufficient to cover the duty required by the country into which the car is to be taken an entry permit known as a triptyque will be issued to the owner.

Presentation of this permit avoids all the intricate customs formalities at ports of entry, it is said.

This permit is good for one year and when it is surrendered at the A. A. A. office in New York, having been properly discharged by the customs officials at port of departure from the country to which it applies, the amount of duty deposited will be refunded.

This arrangement was made possible through the cooperation of the British Automobile Association and the Motor Union and the Automobile Club of France and the Tourists' Club of France. The deposit required for taking cars into Great Britain and Ireland is 33 1-3 per cent ad valorem. Persons making use of this service are advised to get in touch with the A. A. A. office in New York about a week in advance of sailing date in order that all arrangements may be completed.

Comforts for Motorists At Missouri State Fair

SEDALIA, Mo., July 7—The management of the Missouri State Fair, which will be held here Aug. 18 to 25, is making extraordinary arrangements to provide for the comfort and convenience of persons who drive their automobiles to this city to see the fair, a tent city covering 80 acres being the chief feature.

This 80-acre tract adjoining the fair grounds will be laid out with streets and public utilities, including hot and cold water, and electricity. Tents will be erected on half the tract to be rented to visitors and the other half will be available for the free use of those who bring their own tents and camp equipment. The management will provide free a community refrigerator, a check stand, mail delivery and police protection, and will have medical aid easily available.

It is believed that this arrangement will greatly encourage touring to the fair by residents from all parts of the state and from other states.

RECEIVER FOR CLIMBER

LITTLE ROCK, Ark., July 6—X. O. Pindall has been appointed receiver of the Climber Motor Corp. and an order issued closing the plant until an adjustment of the company's affairs can be had. Chancellor Martineau held that the company's finances are in an uncertain condition and that the deed of trust had not been carried out. This action followed the application for a receiver and a judgment of \$60,019 filed by W. H. Owens, trustee for bondholders.

MAKES AN 8-CYLINDER FORD

ST. LOUIS, July 7—An eight-cylinder Ford constructed by the Lambert-Graves Motor Co., Ford and Lincoln dealer, has been attracting much attention on the streets of St. Louis lately. The power plant of the car consists of two ordinary Ford engines set end to end behind two united Ford radiators. The hood is more than twice as long as a regular Ford hood and bears the name of Lambert-Graves.

Birmingham Association Plans Year of Activity

Dealers' Body Will Undertake to Eliminate Unfavorable Legislation

BIRMINGHAM, Ala., July 7—The Birmingham Motor Trades Association, with W. S. Edwards, of the Edwards Motor Co. at its head, is preparing for one of the most active years of its history. Plans are being made to handle many things for the benefit of the automotive business in Alabama, and particularly in Birmingham. Practically all the leading dealers and distributors of Birmingham are now members of the association.

One of the principal things that this association will attempt during the year will be the elimination of considerable local and state legislation that at one time was really necessary, but which is now a hindrance to the progress of the industry.

Among the first of these things to have consideration will be a revision of the license and tax schedules to meet with the actual conditions prevailing in the automotive business of Birmingham, rather than on the method employed when they were arranged some years ago, which was by guess. Most businesses are taxed in this city on the basis of the stocks of merchandise carried, except the automobile dealers, who pay the best guess the license man could make. The association is to put up a strong fight for a change in this "hit or miss" system, and will do everything in their power to bring about a change.

Another item that will come in for considerable attention by the association is the fact that the state requires every automobile dealer to give a bond for \$1,000 to insure observance of the law. This kind of bond has never been required on any other class of merchant in the history of Alabama, and the members of the association have freely expressed the opinion that it is a gross discrimination, and that under the present high standards of the automotive business when the banks are rushing the dealers for their accounts, instead of arching their eyebrows when they are brought in, the automotive dealer should receive the same consideration as any other high class merchant.

Besides legislation of this character the local association is considering many things for the benefit of the motorists and automobile owners. This part of the program has been worked out from the time the car is purchased until it is disposed of by the owner. It includes protection from theft, better distribution of taxes paid on automobiles, road building programs and protection of the owner in repairs and replacements.

The road programs throughout the state will receive the attention of the Birmingham association during the year, possibly more than anything else.

Washington Trade Condemns Overcharging Motor Tourists

Annual Convention at Seattle Elects Elder Hart as New President

SEATTLE, Wash., July 6—Elder Hart of Ellensburg has been elected president of the Washington Automotive Trade Association, succeeding L. F. Titus of Olympia. M. Kulp of Spokane and G. Follestad of Everett were chosen vice presidents.

Reports at the meeting last week showed the trade in this state expects the strong buying market to continue, especially from farming sections. Resolutions were passed calling for strict regulation within the trade to prevent overcharging of tourists for repairs.

C. A. Vane, General Manager of the National Automobile Dealers' Association, stressed fair dealing with the public and said the used car was a profit eater. He said the automobile business had been pounced on as substitute for the saloon business as a public revenue producer. The convention opposed any more tax burdens on the car owner.

Gov. Hart said paved highway construction, although at its peak in this state, is not keeping pace with the necessity for these roads and warned that the public, with increased buying of cars, will not permit cutting down highway improvements.

The association will participate in a celebration to be held in September marking the completion of paving of Pacific Highway from Vancouver, B. C., through Washington and Oregon to the California line.

Westcott Distributors in Meeting See Bright Outlook

SPRINGFIELD, O., July 6—Westcott distributors and sales representatives from all parts of the country assembled here Monday at the plant of The Westcott Motor Car Co. for a general conference. Sales plans for the future and production schedules for the fall and winter were discussed with General Sales Manager E. H. Gilcrest and other officials.

Reports submitted show that prospects are bright for the future, it was announced. It is expected that the company will soon announce new models of an interesting design. Advertising plans were considered by Warren O. Seelye, of Seelye and Brown, of Detroit, and Karl A. Heinzen, advertising manager of the company.

EARLY MODELS CARED FOR

LANSING, Mich., July 7—The Olds Motor Works has installed a special machine shop devoted entirely to the production of parts for the earlier models of Oldsmobile cars which are no longer in standard production. The shop is equipped with machines adaptable to the reproduction of any kind of part.

Dealers' Losses on Used Cars Being Reduced

ST. LOUIS, July 7—That ever troublesome problem of the used car has been costly to automobile dealers and in the first quarter of this year figures compiled by the N. A. D. A. showed that dealers had lost \$23,000,000 on this item. At the present time reports are coming in for the second quarter of the year and first indication are that this figure will be lowered considerably.

Banks Feature Ford Weekly Payment Plan at Los Angeles

LOS ANGELES, July 7—It is not probable that automotive sales during July will continue the remarkable record that has been established in California the first six months of the year. The final week of June showed considerable falling off in demand, according to passenger car dealers, but motor truck business is picking up. This undoubtedly is due to the fact that many prospective purchasers hesitated until they learned the fate of the new motor vehicle bill at the recent session of the legislature.

Farmers are buying almost exclusively low price cars and these not in particularly large quantities. There is practically no demand for cars retailing above \$2000 outside of Los Angeles County. The apricot crop now is being harvested and canneries have restricted their requirements because of the carryover from last year and the high price of sugar.

The Ford weekly purchase plan is proving so successful that banks are running large advertising copy on this subject independent of Ford car copy. Bankers say the plan stimulates saving and although originated to bring about the purchase of an automobile they believe that the saving habit will be formed as the result of the experiment.

JAMES F. BOURQUIN IS DEAD

DETROIT, July 7—James F. Bourquin, vice-president in charge of production of Continental Motors Corp., died this week at Harper Hospital, following an operation for appendicitis. He was 45 years old and had been prominent in the industry for many years, having served with both Liberty Motor Car Co. and Paige-Detroit Motor Car Co., as vice-president in charge of production at different periods of their development.

RECOVERIES EXCEED THEFTS

PHILADELPHIA, July 9—There were 1,571 automobiles, valued at \$2,502,211, stolen here in the six-months period ended June 30. In the same period the police recovered 1,785 machines valued at \$2,705,784. The police attribute the success in the recovery of cars to the drive against reckless motoring, which makes thieves careful for fear of arrest in trying to get away.

Small Town's Dream of Rivaling Detroit Shattered

Court Soon to Dispose of Case Growing Out of Promotion of Factory at Benton, Ill.

BENTON, Ill., July 7—Litigation over the affairs of the Benton Motor Car Co., pending in the Federal courts for nine years, is another step nearer final adjudication, due to the action of Judge G. W. English in denying a motion to dissolve an injunction issued in the suit by the late Judge Wright, who preceded the former jurist upon the bench, and ordering the case to proceed without further delay. He will set the date for the trial in the near future. It will probably come up at the August term.

The litigation grows out of an effort upon the part of citizens of Benton to secure the establishment of an automobile factory. Such a concern was organized and known as the Benton Motor Car Co., with F. E. Stuyvesant of New York City as the moving spirit. Two of the well to do residents of Benton, Harry Stotlar and Jesse Diamond, signed notes for \$10,000 each, and considerable money in addition was subscribed by other citizens. The local stockholders soon found cause for criticism of Stuyvesant and when he attempted to sell out court action was taken. The first suit was filed in the courts at Columbus, Ohio, and the stockholders secured a judgment for \$40,000, which has not yet been collected.

Stuyvesant was enjoined from disposing of his 38,000 shares of stock. He then brought suit to collect on the notes signed by Stotlar and Diamond. Through delays possible under the law, this entire litigation has been pending since 1914. Recently, attorneys for Stuyvesant prayed the dissolution of the injunction order, declaring themselves ready to proceed in the effort to enforce collection of the Stotlar and Diamond notes. Judge English took the position that the suit should be placed in such shape that all the issues involved, should be combined in the single trial and disposed of at one time, thus avoiding delay and a multiplicity of suit. It is now expected that the finding of the court will put an end to the litigation, although an appeal may be taken to a higher court.

The non-realization of the promised automobile factory was a cruel disappointment to the people of Benton. They had hopes that the city would eventually rival Detroit as an automobile center. The glittering prospect painted by the promoters soon faded, as with scores of others of a similar nature and the stockholders lost heavily.

HEWITT TIRES REDUCED

BUFFALO, N. Y., July 6—Hewitt Rubber Co. has reduced the price of its tires, the new list being the same on many sizes as that in effect last January and approximately the same on other sizes. The 30 by 3½ cord now lists as \$15.25 and the fabric at \$12.50, retail.

BUSINESS NOTES

The Northern Motor Securities Company, 605 Indian Terrace, Rockford, Ill., has been incorporated to deal in notes, bonds and mortgages, underwriting automobiles. The capital stock is \$50,000, half of which is held by Duncan Forbes, president.

The Cape Girardeau Manufacturing Co., of Cape Girardeau, Mo., announced that it will soon begin to turn out automobile truck bodies.

Graham Bros., of Detroit, manufacturer of motor trucks, has opened an office at 315 Union Trust Bldg., Pittsburgh, Pa. O. W. Davidis is in charge and associated with him is Harry J. Bostwick.

The Lonergan Automotive Radiator Co., of Rock Island, Ill., has leased a factory building, 40 by 80 ft., at 1109-11 Ninth street and is removing there from its downtown location, 1918 Third avenue. A daily output of 500 radiators is expected when complete machinery and equipment are in operation.

The Shepard Art Metal Co., making interior fittings for enclosed cars, has been combined by the Fisher Body Corp., as a part of the Ternstedt Manufacturing Co., and will hereafter be known as the Shepard Division of the Ternstedt company. C. B. Shepard, who has been in charge

of the Shepard company, has resigned and the direction of the company will be assumed by the Ternstedt organization headed by Paul W. Seiler.

Chanslor & Lyon Co., a large automotive jobbing concern on the Pacific Coast, has established a factory at Oakland, Cal., to manufacture tires which it will market under the name of C. & L. These tires are especially designed for western use and are not to be offered for sale east of the Rocky Mountains. Headquarters of the company, which has eight branches, are at San Francisco.

The Indianapolis Pump & Tube Co., of Indianapolis, manufacturer of the DeLuxe line of automobile accessories, has completed negotiations for the erection of a modern factory building at Greenwood, Ind., 10 miles south of the present plant site. Ground has been broken for the foundations and part of the plant, which will occupy 30,000 sq. ft., will be under roof before July 15, according to officers of the company.

The Lubricating Laboratories is the name of a new company recently organized in Des Moines, Iowa, for the manufacture and distribution of a new non-chatter compound for Ford transmission bands.

Automobile Men Will Aid In Making New Tax Laws

Portland Governor Names Prominent Trade Men on License Board

PORTLAND, Ore., July 7—That the automobile industry will have something to say, for a change, about the provisions of the next state automobile license law seemed assured this week when Governor Pierce announced a committee of five men to study the situation and draw up recommendations for desired amendments to the present law to be presented to the next session of the legislature.

On the committee are James H. Caspell, Portland, editor of *Automotive News*, a local trade publication, and secretary of the Portland Automotive Trades association; C. L. Boss, prominent Portland automobile dealer and vice-president of the Automobile Dealers' association; John H. Hall, Portland lawyer and prominent member of the Oregon State Motor association; W. B. Dennis of Carlton, lumberman, and James Stewart of Corvallis.

The first three men were named by the governor upon the direct recommendation of the automobile dealers' association, that body having been invited by the governor to suggest the names of three men for the committee.

Formation of the committee came about as a result of the promise of the automobile interests to drop a referendum against the three-cent gasoline tax law passed at the last session. The dealers were not opposed to the tax, which is for good road purposes, but were angered that the same legislature which passed the tax did not revise the automobile license fees downward and make special provisions for the licensing of used cars, which now pay the same yearly licenses as new cars of the same weight. The committee will set to work at once preparing its recommendations and considerable relief from the high license fee is anticipated. The governor has indicated he will back the recommendations of the committee and favorable attention to its report is expected from the Oregon legislature when it meets.

TRUCK DEALERS MEET

PHILADELPHIA, July 7—The ninth annual outing of the Motor Truck Association of Philadelphia was held at Morelton Inn, on the Delaware, Torresdale, attended by 150 members and guests, who motored out from the quarters of the Philadelphia Automobile Trade Association, Broad and Callowhill streets, 25 cars being in line. The entertainment committee, Howard Armstrong, chairman, provided a program of field sports, including baseball, golf, quoits and the like, and in addition there were bathing and cards. Dinner at the inn followed. There was vocal and instrumental music.

7,754 New Cars Sold in Detroit in Month of May

DETROIT, July 6—The number of new cars titled in Detroit in May was 7,757, as compared with 6,784 in April, according to reports compiled by the Detroit Automobile Dealers' Association. Open car deliveries totalled 4,332 and closed 3,425 as compared with 3,900 open and 2,884 closed in April. Truck sales showed an increase from 604 in April to 692 in May.

In the light car field Ford deliveries increased from 2,333 to 2,591, most of the gain being in closed models which increased from 998 to 1,226. Chevrolet increased from 1,165 to 1,286, made up largely of increased closed deliveries. Star delivered 196, five more than in April, 141 of which were open. Overland delivered 207 as against 152 in April, 152 of which were open. Gray delivered 60 as against 28, 44 being open models.

Sales in the high priced field were preponderantly closed models, the ratio being about three to one.

G. M. C. PATENT OFFICE MOVED

DETROIT, July 7—Headquarters of the patent department of General Motors Corp. is being transferred by James McEvoy, in charge of this work, from Detroit to Dayton, where he is establishing offices in the laboratories of the General Motors Research Corp. L. M. Spencer and G. L. Lovett, of the patent department, will also transfer to Dayton.

The move is declared a logical one since the research laboratories are headquarters for the development and testing of new devices and mechanisms used in the industry by General Motors Corp. An office and staff of the patent department will be continued in Detroit.

FIAT RACE DRIVER KILLED

PARIS, July 6—(By Mail)—Ernest Lamplano, Fiat race driver, was killed yesterday while practicing for the Faucille hill climb, in Switzerland, on a 122 inch racing car.

WINTHER SALE JULY 12

KENOSHA, Wis., July 9—The property of the defunct Winther Motors, Inc., will be offered for sale at public auction by the receiver at the plant here on July 12, it is announced. Stockholders have received a definite plan of reorganization from a committee of seven, headed by Dr. E. W. Timm, of Milwaukee. This purposes the formation of a new company under the laws of Wisconsin, with a capital of \$500,000, consisting of 50,000 shares at \$10 each. The committee will enter a bid at the sale to take over the property intact and resume the manufacture of Winther trucks.

OVER A MILLION ON TRUCKS

WASHINGTON, July 6—According to the figures compiled by the Bureau of Internal Revenue, \$1,215,509.81 was collected in excise taxes on trucks in May of this year, an increase of \$234,987.16 over the same month last year. Taxes collected on passenger automobiles and motor cycles for May, 1923, totaled \$12,079,341.47 in comparison to \$6,834,472.68 for the same month in 1922. On automobile accessories and parts the amount collected in excise tax totaled \$3,503,587.36 for May, 1923, as compared with \$2,683,883.87 for the same month in 1922.

CHARGE PRICE MAINTENANCE

WASHINGTON, July 7—Complaint has been issued by the Federal Trade Commission charging resale price maintenance by cooperative agreements, in the sale of gasoline in and around Tampa, Fla. Respondents named in the case are the Standard Oil Company, of Kentucky, Louisville, Ky., Gulf Refining Co., Port Arthur, Texas; the Texas Company, Houston, Texas; F. T. Hurner, F. D. Jones, H. G. Thompson, Tampa, Florida; Tampa Automobile Dealers' Association, Tampa, Florida; Tampa Retail Gasoline Dealers' Association, Tampa, Florida.

CONCERNING MEN YOU KNOW

A. J. Knapp, secretary of the Iowa Automotive Merchants Association, attended the meeting of the A. E. A., at Dixville Notch, N. H.

James E. Taylor, for 12 years manager of the Charlotte, N. C., branch of the Goodyear Tire & Rubber Co., has tendered his resignation to become director of sales for the C. C. Coddington Co. of Charlotte, distributor of Buick automobiles.

C. R. Carr, has resigned as general sales manager of the Ruggles Motor Truck Co., Saginaw, Mich. He will engage in private enterprise, due to his personal interest requirements.

I. L. Stayart, formerly connected with the sales department of the Cole Motor Car Co., Indianapolis, has been appointed director of sales for the Ruggles Motor Truck Co., Saginaw, Mich.

Joseph W. Holt, for six years manager of the Charlotte, N. C., branch of the Ford Motor Co., resigned effective July 3 to enter business for himself at Greensboro, N. C., as head of the Holt Motor Co., dealing in Ford automobiles, tractors and Lincoln cars.

Lee A. Folger, of the C. C. Coddington Co., dealers in Buick cars, has resigned as director of the Charlotte, N. C., Automotive Trade Association. Caldwell McDonald, of the Hanes Service Station, has been named to succeed him.

George W. Walker, president of the Trumblepruf Tire Co., of Atlanta, has been appointed vice-chairman to represent the Atlanta district with the Southern Commercial Congress on its industrial visit to Scandinavia in July. The purpose of the trip is to establish closer relationship between southern manufacturers and Scandinavian countries.

T. A. Boyle, formerly with Willys-Overland, Inc., has been appointed assistant sales manager of the new Sterling-Knight Co., at Warren, O.

G. M. Stadelman, president of the Goodyear Tire & Rubber Co., and C. S. Mott, vice-president of the General Motors Corp., have been added to the board of directors of the Lincoln Highway Association. Both Goodyear and General Motors are interested in the project, the

former having contributed \$100,000 and the latter a similar sum for the development of the ocean to ocean route. President J. N. Gunn and the other officials were re-elected at the same meeting.

F. M. Feiker, formerly vice-president of the McGraw-Hill Co., of New York, and more recently on leave of absence as special agent for the Department of Commerce at Washington, will be associated with the staff of the Society for Electrical Development, 522 Fifth avenue, New York, serving as special counselor to all branches of the electrical industry. He will retain a consulting relation to the McGraw-Hill Co., and will continue in a similar capacity his relation to the problems of personnel and organization of the Department of Commerce.

C. C. Rosser, for many years connected with the Detroit Seamless Steel Tubes Co., has been appointed district sales manager, with offices at 1206 Guardian building, Cleveland.

C. L. Falkinburg is now with the Las-Estik Patch Mfg. Co. and is working the eastern territory. He was formerly with A. A. Laboratories Co.

Rollin W. Hutchinson, Jr., has been appointed vice-president and assistant general manager of the O. K. Truck Manufacturing Co., Okay, Okla., formerly the Oklahoma Auto & Manufacturing Co. For over 11 years Hutchinson has been associated directly and indirectly with motor trucks in sales, advertising and transportation engineering capacities with the International Motor, Sterling and Vim companies. The O. K. company, established in 1916, was recently reorganized with Dan L. Jones, of Jonesboro, Ark., as president.

A. G. Denton, at one time connected with Apperson in Pittsburgh, has been named as wholesale manager for the Apperson in Southern California, by Harris M. Hanshue, factory representative on the Pacific Coast.

H. J. C. Miller, formerly sales manager of the Winton Co. of Cleveland and at one time manager of the Winton New York branch, has joined the staff of the New York branch of the Willys-Overland Co.

Bowser Batting High; Has Made Over a Million Pumps

FORT WAYNE, Ind., July 7—S. F. Bowser, founder of the business that has established Fort Wayne as the world's center of the pump industry, was the center recently of a celebration in this city marking the one millionth pump turned out by S. F. Bowser & Co., Inc. Over 4,000 people attended the event which was held in the open air at Weisser park and the entire plant was shut down for the afternoon.

One of the features of the afternoon was the unveiling of the millionth pump turned out by the company. This pump will be mounted on a pedestal in front of the company's offices.

The first pump manufactured by S. F. Bowser & Co. was made in 1882 and was installed in a local grocery store. This year it is expected that the business will reach approximately \$12,000,000.

RAPID GROWTH OF BUS LINES

COLUMBUS, O., July 7—The first motor bus line in Ohio was established about 12 years ago, yet official estimates now place the total of such lines at 420. This represents a numerical gain of 57 per cent over Dec. 31, 1922, when 264 highway transportation companies had 545 busses in operation. Such companies carried nearly 12,000,000 passengers during 1922 and reported gross receipts of \$2,277,000.

PYKE JOHNSON SEES EUROPE

NEW YORK, July 6—The growth of motor transport in Europe is what most impressed Pyke Johnson of the National Automobile Chamber of Commerce, who has just returned from a trip abroad which included attendance at the session of the International Road Congress at Seville, Spain. He found that questions of finance, co-ordination of motor with other forms of transport and that of handling traffic in congested areas are the subjects uppermost in the minds of government officials.

REGISTRATIONS INCREASE IN TEXAS

AUSTIN, Tex., July 9—An unprecedented increase in the number of automobile registrations during the first five months of this year is regarded as reflecting the existing prosperous condition of the people of Texas. The total number of motor vehicles registered for the five months ending May 31, 1923, was 553,542. For the same period of 1922 they were 437,168, an increase this year of 116,374.

400 DRIVERS LEARN HOW

BALTIMORE, July 7—More than 400 motor vehicle drivers were awarded diplomas when the safety school conducted as a part of the program of the Baltimore Safety Council.

Truck Drivers' School Is Aim of N. T. T. O. Assn.

Milwaukee Convention Takes Steps Toward the Education of Drivers

MILWAUKEE, July 7—Definite steps to provide facilities for educating drivers of motor trucks, recognized as one of the greatest needs of the motor transport industry, were taken at the closing session of the annual convention of the National Team and Truck Owners' Association Wednesday. In the following address by David Beecroft of The Class Journal Co., on The Human Element, he pointed out that motor trucks have developed much faster than the driver, and the work of the best engineers living is to a large extent wasted because men who might make excellent horsemen are almost hopeless in properly driving and caring for motor vehicles.

The plans for co-ordinating rail, water and trucking transportation being worked out by the war department, were explained Tuesday by S. Maher Brainerd Taylor of Washington. He exhibited drafts of new plans providing outlying terminals beyond congested districts to be served by motor truck, clean co-operation among transport companies to eliminate the fly-by-night operators who cut haulage rates by unsound business methods and elimination of exorbitant taxes and feeds on the industry were stressed.

A keynote of the convention was repeated evidence of acceptances of motor trucks by the railroads of America as handmaiden to steam service, and the disappearance of the former feeling that the motor truck was a competitor to be feared.

MOTOR EXECUTIVES TO MEET

NEW YORK, July 7—Executives in the automobile industry in New York City have decided to organize a club along lines similar to the Transportation Club, which has its headquarters in the Biltmore. Plans for this were made at a dinner presided over by Alfred Reeves, general manager of the National Automobile Chamber of Commerce. It will be a lunch club where executives can foregather and also entertain visitors from the factories. Until permanent headquarters can be secured the new organization will hold forth at the New York Athletic Club.

ASSOCIATIONS PLAY GOLF

PHILADELPHIA, July 10—The Philadelphia Automobile Trade Association this week entertained representatives from the automobile trade associations of New York, Newark, Baltimore and Washington at the North Hills Country Club. The occasion was Philadelphia's turn to hold the golf tournament the clubs play off every year.

IN THE RETAIL FIELD

Judge W. H. Waddell, counsel, and E. A. Shilts, comptroller, of the Goodyear Tire & Rubber Co., Akron, O., were speakers at the meeting of the Rockford, Ill., Tire club, June 26. Dealers throughout the Rockford territory were guests.

Emil Hobe has organized the Cedar Rapids, Ia., Earl Motor Co., to handle Earl car distribution in that territory. His office and salesrooms are at 125 North First street, west.

A new building being erected at Springfield, Mo., at 542 College street, will be the home of the Pierce-Tenner Service Station.

C. P. Gould, formerly of the Springfield branch of the Packard Motor Car Co. and more recently with the Mansion House Garage, Greenfield, has been appointed retail sales manager for the Giddings Motor Co., Dorr and Liberty dealer, Springfield, Mass.

The Olivier Motor Co., Ford dealer in Holyoke, Mass., has bought the Hampden Garage in that city and is making extensive alterations in the property.

The Pickup Motor Co., Holyoke, Mass., has been named associate dealer with the Giddings Motor Co. to handle the Dorr in Holyoke.

The Joslyn Motor Co., Greenfield, Mass., dealing in the Jordan and Chevrolet, has taken over the Mansion House Garage in that town.

The Jordan-Holyoke Co. has been formed to sell the Jordan in Holyoke, Mass. Robert H. Broadhurst, formerly with the Jordan-Springfield Co., is president, and Robert A. Royce is vice-president and treasurer.

Harry L. Springer has been made manager of the Cochran Sales Co., Baltimore, representatives of the Duesenberg and Rickenbacker cars.

The North Side Nash Company, St. Louis, has leased to the Young Men's Christian Assn. the two upper floors of its building at 2724 North Grand boulevard, in which the association will conduct its automobile school.

W. S. Speer, formerly with the Kohler-Speer Motor Co., St. Louis, is now president of the Speer Automobile Co., 3914 Washington avenue. The Speer Co. is handling Nash cars.

A new North Side branch of the Weber Motor Car Co. in St. Louis was opened last week at Grand boulevard and St. Louis avenue. The Weber Co. distributes Studebakers. A large crowd attended the opening.

Buice & Debord, 28 Wall street, is the name of a new automobile distributing agency established in Atlanta, the new company acting as retail dealers in the Atlanta territory for the Maxwell and Chalmers. G. L. Buice and A. D. Debord organized the company.

Some of the recent additions to the Apperson dealer organization are: Apperson Hanline Co., Akron, O.; Thompson-Howery Motor Car Co., Charleston, W. Va.; Bagley & Malandorn Co., West Frankfort, Ill.; Albert C. Jones, Rockland, Me.; Russell & Hathaway, Springfield, Mass.; C. F. Stanton, Syracuse, N. Y., and the National Automobile & Distributing Sales Corporation, Albany, N. Y.

Elmer Crego, for several years a member of the retail sales force of Willys-Overland, Inc., Toledo, has been made manager of the used car department to succeed Leo Nachtrab, who has left for St. Louis, to be retail sales manager for Willys-Overland, Inc., there.

The Schwartz Motor Co., with G. A. Schwartz as manager, has been organized in Bessemer, Ala., to handle the Chevrolet.

Smith Brothers & Co. is a new concern in Bessemer, Ala. They will handle and service the Haynes, Cole, Elgin and Columbia cars.

R. E. Stallings, Lincoln, Ill., owner of the Stallings Auto Sales Co., has purchased the plant of the Lincoln Garage Company, corner of McLean and Pulaski streets, succeeding L. A. Sanford who retires. The former will continue to distribute Dodge Bros. cars, but, in addition, will handle the Cadillac line in the Logan county territory.

Raymond Carroll, one of the managers of the Hoxey Motor Co., at Mexico, Mo., and Miss Victoria Brooks of the same city, were married there recently.

Acree Motor Co., Nash dealer at Mobile, Ala., recently moved from 111 North Royal street to 104-106 North Royal street.

Among new Cleveland distributors are the following: J. A. Carson Auto Co., Huntington, N. Y.; Automotive Electric & Storage Battery Co., Danville, Pa.; Gosch's Drexel Hill Garage, 6037 Cottage Grove avenue, Chicago, Ill.; Campbell's Garage, 1158 Asbury avenue, Ocean City, N. J.; Wm. H. Kieser, 11 Broadway, Milton, Pa., and A. M. Shearer, 600 Philadelphia street, Indiana, Pa.

William C. DeHaven, has been appointed sales manager for John Barzee, Oldsmobile dealer at Syracuse, N. Y.

Packard Enterprises, Inc., of Atlanta, Packard distributors in the Georgia territory, announce the appointment of Harvey Chafin as retail sales manager, and John B. Reeves as assistant retail sales manager. Both have been identified with Packard distribution in the Atlanta territory for some time.

The Cramer-Anderson Motor Co. of Centerville, Ia., has changed the firm name to the Cramer Motor Co. The concern handles Dodge cars in Centerville territory.

The J. M. White Motor Co., Sioux City, Ia., has moved from its old location to larger quarters at 505 Pearl street. The first floor of the building is given over to salesroom while the entire second floor is used for shop purposes.

Among new Nash dealers are the following: J. M. Vann & T. W. Sears, Ahoskie, N. C.; E. W. S. Cobb, Columbus, N. Y., and Lamb Motors Co., Arctic, Rhode Island.

Walter S. Moore, well-known business man of Columbia, S. C., is now distributor for that section of South Carolina for Anderson motor cars, manufactured at Rock Hill, S. C.

The Kiser Auto Exchange has been incorporated at Charlotte, N. C., with a capitalization of \$100,000. The company will buy, sell, exchange, wreck and rebuild automobiles and will handle accessories and supplies.

The following have been appointed as Nash dealers in Oklahoma: Mershon Motor Co., Walters; Cushing Nash Motor Co., Cushing; Union Cotton Oil Co., Prague; B. F. Behmer, Boise City; E. R. Harrison, Byar; John Talley, Wayne, and the McIntyre Garage, Allen.

The Glover-Muirhead Co. has been chartered at Charleston, S. C., to deal in automobile tires and accessories.

The People's Motor Co. has been chartered at Mullins, S. C., with a capital stock of \$10,000.

The Clark Motor Co., which has been the downtown Ford dealer in St. Louis since October, 1921, has sold out to a new firm, Chamber & Long, Inc., a company which the Ford branch in St. Louis authorizes. A. T. Chambers and E. F. Long make up the company, which is capitalized at \$100,000. Long has been associated with Ford dealers for a number of years, but Chambers has not been connected with the automobile business, having been president of the Dios Chemical Co. Their address will be 1123 Pine street, the same as that of the Clark company.

The Lang Tire Co. is a new retail concern at 133 East Main street, Columbus, O., dealing in Kelly Springfield tires and tubes exclusively.

Construction of a modern automobile sales and service building at Memphis, Tenn., on the south side of Union avenue, east of Fourth street, for occupancy of the Graham-Merrin Co., will start soon. It will be ready for occupancy about Nov. 1.

Among new Nash dealers in Ohio are the following: Hein & Haubert, Lisbon; Sloan Auto Sales Co., Calion; A. & D. Auto Sales Co., Feebles; Bateman & Canter, Milford; J. A. Ferry, Fayetteville; R. R. Cory, Frankfort; H. F. Sallee, Higginsport; J. W. Kibler, Mount Crab; H. R. Keiffer, Sardinia; E. M. Murray, Nash Co., East Court street, Sidney; Standard Garage, Wellsville; G. F. Prickett, Blanchester; Dodson & Olson Garage, Somerset; Albert Foster, Waverly, and O. L. Palmer, Greenfield.

Emil Rottermann and C. F. Montague have been appointed assistant sales managers of the Southwest Nash Automobile Co., Nash distributor at St. Louis. Each has a staff of salesmen under his supervision with O. C. Hazelrigg, sales manager, supervising the entire force.

The Oswalt-Riechman Motor Car Co. has commenced the erection of a \$50,000 garage and sales agency plant at the southeast corner of State and Twelfth streets, East St. Louis, Ill., the frontage being 112 ft. and depth 150 ft. The company was recently organized with O. R. Riechman as president, W. L. Oswalt as vice-president, and Herman Zierrath as secretary-treasurer and sales manager.

The Darby Motor Co. is a new concern in Birmingham, Ala., with C. L. Darby as president. The Auburn six will be handled by this concern.

The Evans Motor Co. of Columbia, S. C., has been chartered for general automobile business.

Wadsworth-Sehorn Co. has been chartered at Charlotte, N. C., for automobile business in Charlotte. The company has the agency for Reo cars in this section, territory covering 50 counties in North and South Carolina.

St. Louis Truck Dealers Adopt New Business Rules

ST. LOUIS, July 7—The committee appointed by the Bureau of Truck Dealers of the St. Louis Automobile Dealers' Association presented a code of ethics to their membership which provides for the handling of allowances for used cars, terms of sale, etc.

"What Can I Get For It?" will be the guiding thought in making allowances. Twenty-five per cent cash is to be obtained on all orders and all payments shall be completed in 18 months. Repossessions are to be reported to the secretary of the St. Louis A. D. A. within 24 hours.

These rules are to be in effect on trial for 90 days when final arrangements will be made as to their continuance.

STATE BUILDS OWN ROADS

DETROIT, July 6—The State of Michigan has begun the organization of a road building force capable of constructing 200 miles of highway a year, according to announcement by Gov. Groesbeck, as a result of alleged collusion among road contractors in bidding upon state work. The collusion grows out of bids on a Detroit-Lansing route which was to be let in three sections. Three contracting firms were each low on one section but none low on more than one. By forming the state road force contractors would be obliged to bid against the state, Groesbeck said, and not only will have to meet state figures but also will be obliged to guarantee performance within time limits which the state cannot better.

The C. F. Sharpe Motor Co., distributors of Reo cars and trucks at Springfield, O., has moved into its new building in West Main street which it recently purchased. The building was completed a few weeks ago by George Limbocker and sold to C. F. Sharpe.

The showrooms of the Baltimore branch of the Wills Sainte Claire Co. of Pennsylvania have been moved to much larger quarters at 105 West Mount Royal avenue. The branch is in charge of Raymond W. Thompson.

The High-Maynard Garage, Columbus, O., has taken the central Ohio agency for the Monroe line of cars. Steps are also being taken to handle the Strattan cars when they are on the market. W. K. Knauss is general manager of the company.

Among new Auburn distributors are the following: Harry R. Boyer, 575 W. Main street, Bloomsburg, Pa.; Howard C. Frye, Colgate, Md.; J. R. Corman, Coburn, Center County, Pa.; Theodore W. Pehrson, Renova, Clinton County, Pa.; Point Garage, Johnstown, Pa., and D. R. Flower, Park Falls, Wis.

Leo Kelly, owner of the Kelly Garage and salesroom at Edina, Mo., and agent for several automobile companies, and Miss Loraine Berberet, were married last week.

The following have been appointed as Nash dealers in Pennsylvania: Hartman & Binder, 3rd and Reading avenue, Boyertown; H. E. Montgomery, 219-21 N. McKean avenue, Kittanning; Morris S. Bollag, 2859 Emerald street, Kensington, Philadelphia; Burd & Moore, Lock Haven; Yemm & Gallagher, W. Earley avenue, Coaldale; Madera Oil & Gas Co., Madera; Burton Bros., California; L. J. Mitchell, Charleroi; Hoebler-Zoglmann Co., 818 Brownville road, Pittsburgh; Schmoyer Motor Co., 164 Walnut street, Kutztown, and the Tri-State Garage, 164 Walnut street, Uniontown.

Sales of the Vesper-Buick Co. of St. Louis for the month of June, 1923, totaled three cars more than double the number sold in June, 1922.

C. W. Myers, Danville, Ill., has purchased the Verne Jones building on South Hazel street and will remodel and enlarge it for a sales agency and service station for International trucks, having been appointed distributor in the Vermilion county territory. He will also operate a battery service station in conjunction.

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

Hupmobile Racer With Duesenberg Engine

Q—We have a Hupmobile chassis with a Duesenberg motor and our desire is to make it a dirt track racer and would like to ask a few questions, which we hope you will answer at your earliest convenience. Would shortening the wheel base to about 80 in. be of any advantage?

1—An 80 inch wheel base is a little bit too short for the average type of dirt track and you will find that a car with such short wheel base will ride very hard. We would recommend a wheel base not shorter than 86 inches, and believe that you will find that the majority of dirt track cars have wheel bases between 86 and 96 inches in length.

2—Should the exhaust and intake ports be enlarged?

2—You do not state what model of Duesenberg engine is installed in this chassis, assuming however, that it is a four cylinder model G1 with horizontally mounted valves, we would not advise any enlargement of either the inlet or exhaust ports. If this is the model G1 Duesenberg it is designed as a high efficiency engine and very little will be accomplished by enlarging the ports. We would advise however, that you use a small emery wheel and flexible shaft outfit and smooth out as far as possible the inside of the gas passages on the inlet side of the engine. Nothing is required in the exhaust passages and you may leave them as they are.

3—Would setting the body to the left side of the chassis be of any particular advantage, and in so doing would it be necessary to fit the motor and differential to the left side of chassis?

3—If the car is to be driven as a single or one man car, its track holding ability will be increased slightly by placing the body on the left hand side of the chassis. If this is done it will not be necessary to change any other part of the chassis although you may be forced to install the steering column at an angle in order to make the steering wheel within easy reach of the driver. If only a slight angle is required on the steering post it may be installed with a fabric universal which will allow a slight misalignment and will also tend to absorb some of the road shocks.

4—Would two carburetors be of any advantage? — P. H. Webber Company, Hoopeston, Ill.

4—The installation of two carburetors of the same diameter as the original carburetor would probably give better starting and better acceleration which is a desirable thing on dirt tracks. It probably will be necessary however, if the carburetors are of the same size as the original equipment, to install jets of slightly smaller size. The correct size

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

jets and method of installation are best determined by consulting any of the well known carburetor service stations in your vicinity.

It is advisable before completing this car to communicate with the manufacturers of the engine and determine its power characteristics as it will be necessary to know the torque and maximum brake hp. and speed in order to determine the correct gear ratio.

FLAT RATES

The second article in the Flat Rate series will be found on page 9 of this issue. Study the schedules given but FIRST read the text so you will know how to apply these schedules.

Eccentric Commutator Prevents Charging at 28 M.P.H.

Q—Advise what makes a North East generator on the Dodge car stop charging at 28 m.p.h. At 20 m.p.h. it charges all right but cuts out at speeds over 28. Changing the adjustment of the third brush does not help any.—Harry Edmark, Mountain, Wis.

From the symptoms described it appears as if the commutator has been turned down at some time and is probably eccentric with respect to the bearing races. It is probable that the armature was turned on the centers in the end of the shaft and these are possibly eccentric with respect to the bearing races. You might check this condition by removing the commutator cover and bearing on the brushes with the fingers at speeds at which the charging stops to see if additional brush pressure will cause the generator to charge. If so, it indicates eccentricity as above described.

About the only other possibility would be an intermittent short or ground in the armature, which only shows up at high speed, due to centrifugal force. However, this last suggestion is rather unlikely.

1916 DODGE HAS RELAY GENERATOR REGULATION

Q—Is there a way to increase the charging rate on a 4 wire North East generator on a 1915 Dodge?

1—The regulation of the current output of the four wire North East motor generator is by adjustment of the springs on the limiting relay regulator. In the May 31, 1923, issue of MOTOR AGE there is printed under the heading "Four Wire Motor Generator on 1915 Dodge" a circuit wiring diagram of this system. If you will refer to this diagram, which shows the limiting relay in the lower part of the cut and to the right you will notice two coil springs actuating two arms and two sets of points. Increasing the tension on these springs will increase the charging rate.

The same tension should be given to each spring when adjustment is made and it is advisable to check the tension on the individual springs by wedging one set of the points open and trying the engine through the speed range for current output and then testing the other set in the same manner. For instance if the engine is running at a speed where the generator shows 8 amperes with both sets of points working and if one set is taken out of the circuit the current drops to 3 amperes the same reading should occur when the other set of points is brought into action and the first mentioned set is wedged or thrown out of the circuit.

Garage Not Large Enough for Four Rows of Cars

We are planning to build a 75x75 ft. garage on a lot 75x142 ft. at once, with the intention of enlarging it later. We now occupy a 50x142 ft. building with a driveway down the center, office on one side in front and battery station on the other side, wash rack in the back and work shop taking in a part of one side with storage cars for the balance of the shop side and along the other side.

We would like any building plans or assistance of any kind you can give us. Would it be possible to store four rows of cars by having one row along each side wall and two in the center, back to back, and two aisles running from the front to the back and park the automobiles on an angle?

We will greatly appreciate any assistance that will help us to utilize as much space as possible and arrange things to the best advantage. We want to add one more thing in our new building, and that is a ladies' restroom.—Central Auto & Machine Works, Albuquerque, N. M.

We have laid out a plan for you on a space 75x75 ft., so that it can be enlarged without any interference with the existing departments. We have followed more or less the layout which you say you have in your present building. It would be quite impossible to store four rows of cars in the width you have, as it requires 50 ft. for two rows with a central aisle for medium size cars. Your best course would be to build the shop along one side, as shown in the plan, and reserve about 50 ft. or possibly a little less, if your cars run to the smaller sizes. The only way you could store four rows of cars, would be with a central aisle and two rows along each side, one behind the other. Even in this way the aisle would be rather narrow.

We do not see how you could work the shop into this size building to good advantage using this system of storage unless you narrow up the sales and office section, install a central driveway and use only one side of the garage for storage with two rows of cars and reserve the other side of the aisle for the shop. We believe that the arrangement we show would be the best however, with this size building.

If you were to build the whole 142 ft. now the other might work out better because then you could use a greater depth for your sales department and machine shop and still have plenty left for a repair shop.

Architectural Service

IN giving architectural advice **MOTOR AGE** aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among

other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

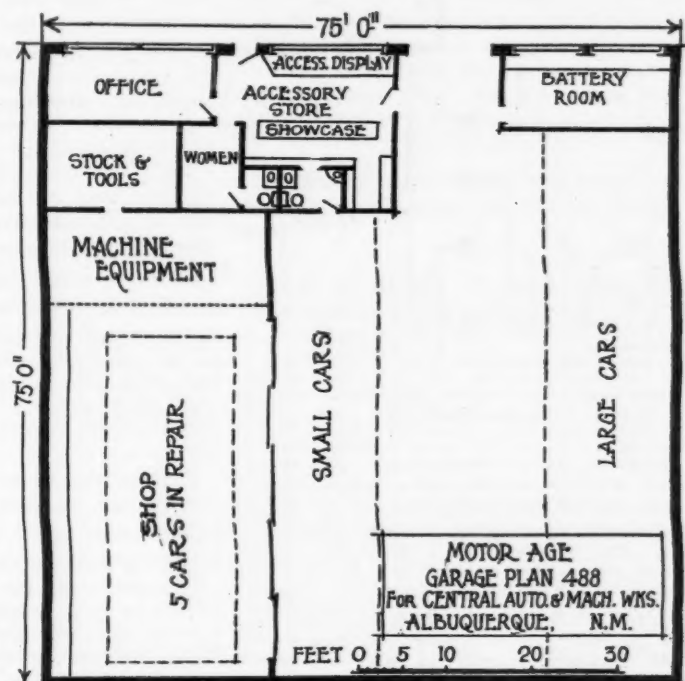
What departments are to be operated and how large it is expected they will be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.



Piston and Cylinder Clearance On a Number of 1920 Cars

Q—What is the clearance between pistons and cylinder walls on all makes of cars. If this information is in different issues of the *MOTOR AGE* please send them also that we may get the complete list.—Minier Motor Co., Minier, Ill.

MOTOR AGE does not possess a complete list of the manufacturers' recommended clearances. We are printing however, a list of clearances for 1920 model cars which was part of an article printed in *MOTOR AGE*, May 25th, 1922.

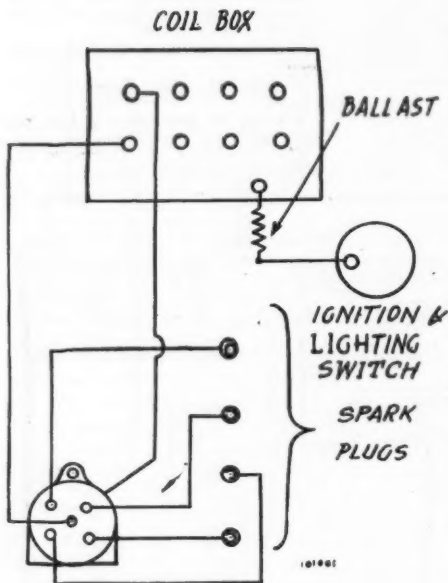
The readers should bear in mind that this data concerns 1920 cars and it is possible that the clearances recommended by the factory have been changed since. In order to get information requested on all cars it will be necessary for you to communicate with each of the factories.

OF COURSE

You have been reading the series of articles on tire merchandising. Perhaps you have been thinking of equipping your shop for tire repairs. Number eight, of the tire series, on page 17 of this issue, tells you something about the equipment you will need.

Maker	Finish	Diam.	Clearance	Piston Material
Chalmers	Grind	3¼ in.	0.005	Lynite
Chevrolet	Ream	3.686 in.	0.003	C. I.
Continental	Grind	3¼ in.	0.001	C. I.
Continental	Grind	3½ in.	0.002	C. I.
Continental	Grind	3¾ in.	0.002	C. I.
Continental	Grind	4¼ in.	0.002	C. I.
Continental	Grind	4½ in.	0.002	C. I.
Dodge	Ream	3¾ in.	0.003	C. I.
				Taper from Magnalite
Franklin	Grind	3¼ in.	0.003-0.001	
Hudson	Grind	3½ in.	0.0035	C. I.
Hupmobile	Grind	3.248 in.	0.001	C. I.
Kelly-Sp'field	Grind	3.7460 in.	0.003	C. I.
		4.4970 in.	0.003	C. I.
			0.015	
Locomobile	Grind	4½ in.	0.003	C. I.
				0.004
Lycoming	Grind	3½ in.	0.0065	C. I.
Maxwell	Grind	3.622 plus	0.013	C. I.
Mitchell	Grind	3¼ in.	0.0025	C. I.
Oakland	Ream	2½ in.	0.005	Alum.
Oldsmobile	Ream	2¾ in.	0.004	Lynite
Packard	Grind	2.998 in.	0.002	C. I.
Pierce	Grind	4½ in.	0.002	
			0.003	C. I.

Battery Ignition Will Not Work On Magneto Current



Connections for battery distributor using regular Ford coil

Q—How can I connect up an Atwater-Kent ignition system on a Ford car so that I can switch from battery to the Ford magneto? Also give wiring diagram. This outfit is special for a Ford car.

1—The Atwater-Kent system to which you refer is doubtless type LA. This battery system and all other battery systems we know of must be used with the storage battery current and will not work on the alternating current developed by a Ford magneto. This being the case it is not advisable to try to use the type LA Atwater-Kent system on one of the old Fords which does not have a storage battery.

On the new Ford it is possible to use it in two ways, one of which includes using the regulation Ford coil box. A diagram showing method of connecting the distributor and interrupter with the old coil box is shown. The wire normally running from the ignition and lighting switch to the lower terminal on the coil box is disconnected and a ballast resistance provided with the Atwater-Kent system is connected to the coil box terminal, the wire then completing the circuit back to the ignition and lighting switch. The vibrator screws on the four coils are all turned down so that the points are held tightly together and then one coil at a time is used while the other three are held in reserve. The necessary connections are shown in the diagram. If one coil should develop trouble it is only necessary to switch the two connections over to another coil.

The same Atwater-Kent system is also furnished complete with a coil of its own in which case the connections are as shown in the other diagram. Under these circumstances the regulation Ford coil

box is not used in any way and may be removed from the car if desired.

Method of Timing 1920 Buick

2—Tell me a good way to time a 1920 Buick six ignition system.

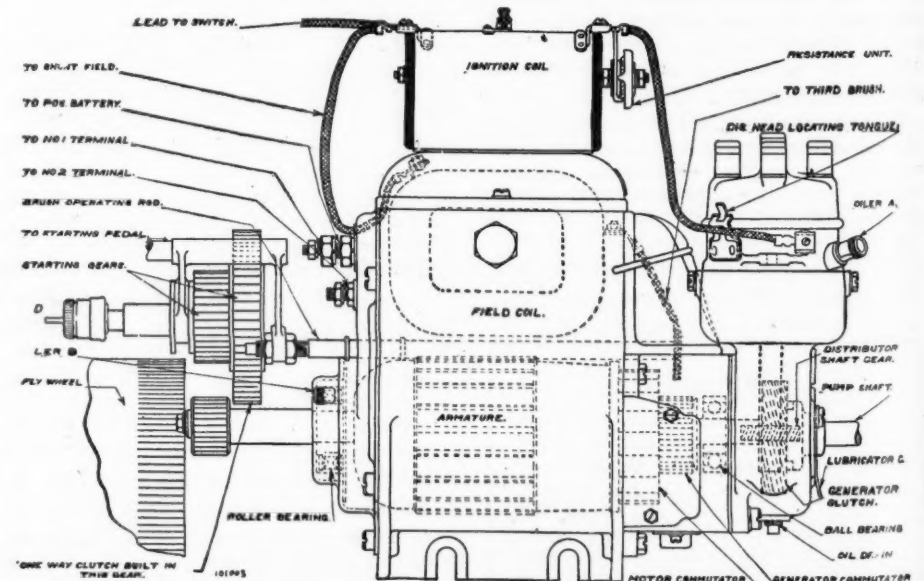
2—Place the spark lever on the steering wheel in the fully retarded position and turn the engine to the 7 deg. mark which is approximately 1 inch after dead center as measured on the flywheel. The number 1 cylinder should be on the firing stroke, that is the piston has just come up on compression.

Then remove the distributor cap and lift off the distributor brush and loosen the timing adjustment screw in the center of the distributor shaft. Turn the breaker cam so that the distributor arm when replaced will be under the number 1 high tension terminal, when the distributor head is replaced. This sets the cam in approximately the right position. The cam should now be carefully located by rocking it backward and forward and it should be locked in such a position that when rocked forward the contacts will be opened by the cam and when rocked backward the contacts will just close. This slight amount of motion is possible due to slack in the distributor mechanism.

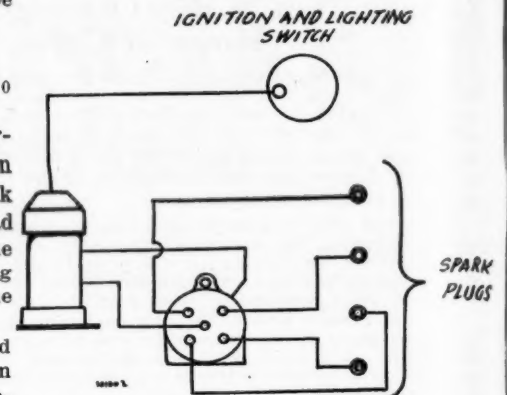
Tighten the adjusting screws securely and replace the distributor arm and distributor cap. As a final check it might be well to disconnect the two small wires on the generator and turn on the ignition switch so that discharge current to the ignition coil will show on the ammeter. With someone watching the ammeter turn the engine over very slowly and see if the ammeter hand drops back to zero when the flywheel is again at the firing position. Be sure to replace the generator wires.

Diagram and Construction of Motor Generator On 1920 Buick

3—Can you send me a diagram showing all the parts and the order in which they go together on a 1920 Delco motor gen-



Delco motor generator on 1920 Buick



Atwater-Kent LA Ignition with special coil on Ford

erator used on Buick car. Also give internal wiring diagram. — Graduate Mechanic.

3—The best way to make sure that you properly reassemble a job is to very carefully watch what you do when you take it apart. However, it may help some to be able to see the end view and side view of this motor generator together with ignition outfit and starter gears. We accordingly give two illustrations which show these views. We also show wiring diagram for 1918, 1919 and 1920 six cylinder Buick.

VALVE TIMING OF 1915 WINTON

Q—Give the proper valve timing on a Winton Big Six model 1912.—F. Ballantyne, Nelson, B. C.

The timing of the 1913 model 17B which carried an engine similar to the 1912 model is as follows: Inlet opens 21 degs. after upper dead center, intake closes 34 degs. after lower dead center. Exhaust opens 54 degs. before bottom center, exhaust closes 16 degs. after upper center. 16 degs. on the average size flywheel would mean about 2 inches on the flywheel rim, after the upper dead center position for the closing of the exhaust.

Spasmodic Trouble May Be Due to Vacuum Tank

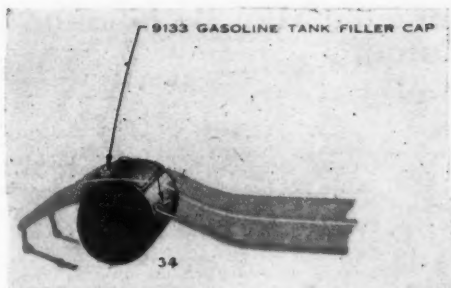
Q—We would appreciate any suggestions you might give for the following trouble in a 1922 Maxwell touring car, engine No. 371722, age—5,800 miles. This car seems to develop a sort of "spasmodic inertia." Sometimes it pulls fine up all kinds of grades, it suddenly will develop this little malady and slow right down even on the slightest grade. In cases where the grade is rather long the exhaust sounds as though only two cylinders were firing although if the car is stopped the engine idles fine on all four.

On a level stretch with throttle set at 25 miles speed, the car will sometimes lose power and slow down to about 17 m.p.h. then it suddenly will spit back through the carburetor and pick right up to 25. This sounds like dirt in the gas line but I have cleaned out the line, examined the floats in vacuum tank and carburetor and looked at the screens, and there is no dirt. —W. W. Townsend, Springfield, Mass.

As the first step in locating this trouble we would suggest that you clean the strainer at the bottom of the gasoline tank and also examine the gasoline tank filler cap to determine whether or not the air vent hole in the cap is open. If the air vent hole is obstructed the flow of gasoline to the vacuum tank and carburetor will be impeded. There is also a small air vent on the top of the vacuum tank which should be examined.

After you have checked on these items if you operate the car and find that it behaves in the same manner, would suggest that you remove the vacuum tank entirely and secure a new one or try out the car with a gravity tank mounted at the same height above the engine as the present vacuum tank. Any suitable one gallon can, can be used for this purpose. We have been informed by the local Maxwell distributors that a few cases of vacuum tank trouble have been encountered where apparently all parts of the vacuum tank mechanism checked up O. K., nevertheless the tank failed to perform, and with this in view we are advising you to proceed as outlined previously.

If the gravity tank installation causes the car to perform satisfactorily we would advise that you return the tank to the nearest Maxwell distributor who will replace it with a new one.



With vacuum feed, a vent hole is required in gas tank filler cap

CORROSION CAUSES VALVES TO STICK

Q—We have had considerable trouble on Studebaker car engines, both Big Six and Special Six, with sticking valves, in all cases finding the trouble due primarily to exhaust valves rusting. We have been most careful in replacing these valves to insure a snug working fit, using only high grade steel valves, but the trouble recurs, more especially on cars doing only short runs around the city. Can you suggest a remedy?

1—One possibility is that the valves do not seat perfectly and that the exhaust gases get by and work down past the stem, causing the corrosion that you refer to as rust. The remedy, if this is the case, is to use a good valve seating reamer and ream out the valve seats. Then grind in the valves carefully. Another possibility is that there is a crack in the cylinder jacket which allows water to work onto the valves. If the condition is experienced in several cars however, this is not very likely.

Another possibility is that the oil being used contains some acid. You can test it by getting litmus paper from a drug store and putting it in the oil. If the paper turns red it indicates the presence of acid. The paper can be made to turn blue by putting it in ammonia water or soda water solution. It occurs to us that possibly you are fitting the valves too closely especially with reference to the stems of the exhaust valves. Intake valve stems need to be fitted closely to prevent air leaks but this is not the case on the exhaust valves so

would suggest your giving them a little more clearance.

2—We have one car, a Studebaker Big Six model, which has what sounds like a tappet knock. The valves and tappets fit snugly, and the base of tappets appears to be O. K., and the valve clearance is .006. What is the cause?—The Vancouver Motor & Machine Shop, Vancouver, B. C.

2—One possibility is that a flat spot has been worn in the base of the valve tappets or push rods against which the cams operate. This could be determined by inspection with the valve tappet removed or might be determined by checking the clearance between valve tappets and valve stem when the valve is in the closed position and the engine is turned over. Variation in the clearance may indicate either a flat spot on the back of the cam or a flat spot on the valve tappet or push rod.

It is also possible that the trouble is due to piston slap instead of tappet noise.

LACK OF HEAT AT CARBURETOR CAUSES POOR VAPORIZATION AND FOULED PLUGS

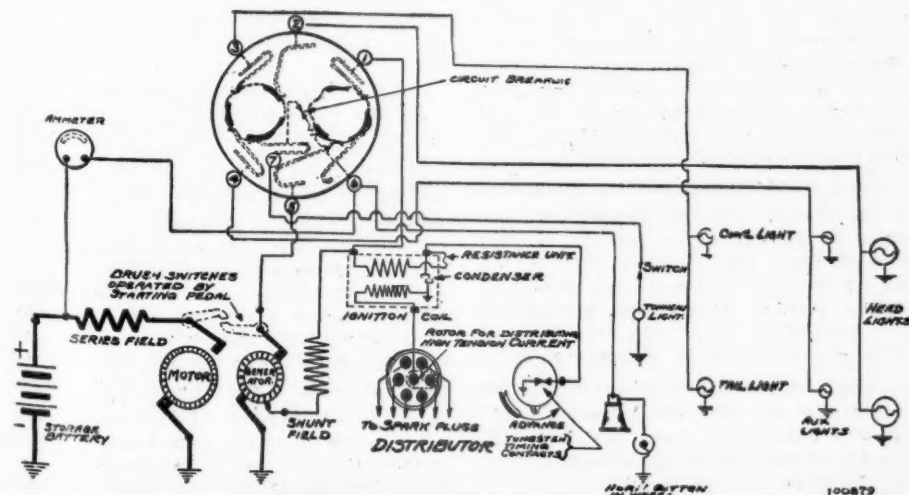
Q—We have been having trouble with a Buick K-44 fouling the spark plugs. It does not foul the same plug every time. Every plug will be firing when you stop but if you let the engine get cold it nearly always fouls a plug before it warms up again. It seldom fouls a plug when the engine is hot. The car pulls and works fine after you get the engine warm and the plugs firing. This car has been run about 3000 miles since it had a new cylinder block, pistons and rings. We have cleaned the carbon, ground the valves, looked at the interrupter points and inspected the piston rings and everything seems to be in good shape. What can be the trouble with this car?—Foster M. Hummel, Bloomsburg, Pa.

The Buick model K-44 was made in 1920 and since this car was designed the quality of motor fuel has changed considerably. Accordingly the present day fuel does not vaporize as well with the K-44 carburetor as if a 1923 carburetor and hot-spot were installed. According to information received from a Buick branch the mixture on your car is doubtless too rich in order to compensate for the lack of heat at the carburetor. Accordingly when running a deposit of soot forms on the spark plugs and when you attempt to start again with the engine cold the soot and oil deposit short circuit the plugs and prevents their firing.

The installation of the 1923 carburetor equipment will undoubtedly overcome this condition and this equipment may be obtained from any authorized Buick service station or branch. If there is no distributor in your town you can doubtless get in touch with one at Pittsburgh.

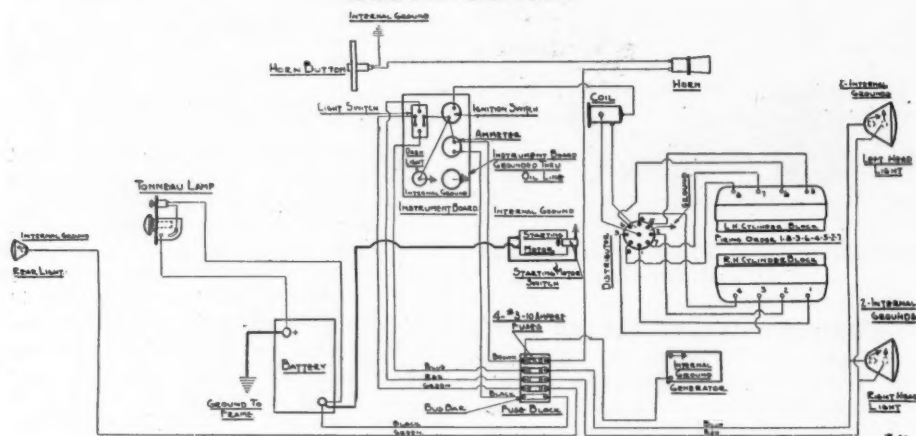
HOW BRUSHES ARE MADE

Brushes are made with bristles or hair rigidly set in a matrix, like hard rubber, and bound to a handle with wire or tin. The varieties commonly used in automobile painting are bristle, "camel-hair," ox-hair, fitch and badger-hair. They are made in various shapes and sizes to fit the different needs of the work—such as flat, flat chiseled, round, oval and oval chiseled.



Wiring of 1918-1920 Buick cars

Battery Discharge On Ammeter May Be Due to Stuck Cutout



Q—We have a King 8 model EE-F-G 1918 car which is giving us trouble in the ignition. This car got to where you could turn the ignition switch off and the ammeter would still show discharge. We went over the wiring carefully to see if we could find a short but could not. We then put new wires on, but it still did not fix the trouble. We then thought maybe it was the ammeter and put on a new ammeter but still does the same.

The battery is in good shape. When you first start the car the ammeter does not show charge until you speed up to 15 or 20 m.p.h. We have tried new fuses. We worked the starter and starter switch over and did not find any shorts. Is it possible that the coil is burnt out? Would like to have you version on this car at once. This car has Atwater-Kent ignition.—A Texas Subscriber.

The symptoms on this car point to a stuck cutout; that is, the points on the cutout not breaking apart when the ignition current is shut off at the switch. For tracing and completing the test which we will outline we would refer you to cut. The cutout in this system is located inside the generator and as the first test we would advise that you remove the generator wire which is marked "brown" in the cut. If removal of this wire causes the ammeter needle to return to zero it is indication of trouble in the cutout. If dressing the points on the cutout does not eliminate the trouble it is advisable to replace the cutout or send it to an authorized service station or to the makers.

If the test does not prove the cutout at fault remove one by one the three wires fastened to the ignition switch. One of these wires goes to the primary of the coil, another to the lighting switch and the other to the dash light. After removing one wire take a glance at the ammeter and see whether it has made any effect on the reading or position of the needle; if not, you can replace the wire and detach the next one and repeat the performance of looking at the ammeter needle on the second and third wire. If the removal of one of the three wires mentioned does cause the hand to return to zero you will find the exact point of the ground or short circuit by tracing that wire to the connection at its other end. For instance, if the wire connecting the ignition switch to the coil primary, when removed at the ignition

end, allows the hand to return to zero you can find the point along the wire where the ground exists by replacing the wire onto the ignition switch and removing its other end from the coil. With the ignition coil end of the wire removed from the coil terminal the hand will return to zero if the wire is O. K.

If it does not return to zero it indicates a ground some place in the wire between the coil and the ignition switch. The same holds true of the other wires leading off from the ignition switch. As before stated we would suggest that you look to the cutout as the most likely cause of the trouble.

THE REASON FOR DRY CELLS ON MAXWELL WITH DUPLEX MAGNETO

Q—We would like information on some trouble we are having with a Maxwell 1916 model car concerning ignition. It has high tension magneto, working with dry cells as a "booster" for starting. The magneto has been sent into an electrical service station for repair and they claim it needed rewinding which they say they did. The only way the car can be started is by towing and from that I think the magnets are weak. When the starter switch cuts the dry cells in it seems the dry cells kill the magneto current or the magneto current kills the dry cells, one or the other. For my part I have not had very much experience with Maxwells but I had a regular Maxwell mechanic helping me and it has him puzzled. The owner claims that the dry cells are new. Could it be that the dry cells are weak too?—M. O. McAuley, Weldon, Ark.

To better trace out the trouble in this system we would refer you to the Maxwell wiring diagram printed on page 44 of the June 7, 1923 issue of MOTOR AGE. With this type magneto it is not possible to use 6 volts from the storage battery as the starter storage battery is connected to ground and a ground cannot be used with the magneto. It is for this reason that dry cells are used.

If by accident these cells should become grounded, or a ground should occur in one of the wires, it would prevent operation of the system when using the starter switch, as its operation also makes a connection from the dry cells through an inductance coil mounted near the magneto.

Two things will prevent the magneto

from firing under these circumstances. One is a ground anywhere in the circuit of the dry cells, and the other is a reversed connection, either at the dry cells or at the magneto.

To test for ground would suggest that you remove both wires from the interrupter cover of the magneto. Referring to the wiring diagram, you will note that these wires are marked No. 17 and No. 18 and are the same wires that eventually connect at the dry cells where they are marked No. 15 and No. 17. Disconnect the storage battery ground terminal. You can now step on the starter switch and nothing will happen due to the battery being disconnected.

The circuit of the dry cells however, should now be complete and you can test this by flashing the two small wires together which have just been removed from the magneto. If they give a slight spark it shows you have a good circuit from the dry cells and you should now try flashing first one and then the other to the frame of the car. If either one of them flashes it shows that your trouble is a ground on that wire but if neither one flashes there is no ground and you should try reversing them on the magneto interrupter cover.

It is possible that the constant usage of the car with the wires incorrectly installed on the magneto interrupter cover has affected the magnets of the magneto. To determine this it is only necessary to disconnect the two wires in question from the interrupter cover and crank the engine by hand. If spinning by hand will start the car using straight magneto ignition it is an indication that the magneto itself is in fairly good condition. This test should be carried out in conjunction with the other test and will give a complete check on the ignition system.

It is not advisable to follow the dry cell wiring circuit exactly as shown in the diagram because the removal of the magneto magnets from their original position would necessitate reversing the two wires that go to the magneto interrupter cover. The only true way then to determine which way the wires should be placed on this cover is to try them both ways and from what we can learn of your letter you have these wires incorrectly installed.

USE CARE IN BURNING CARBON

Q—We would like to know if it hurts to burn the carbon out of air cooled engines.—A. E. Hudson, White Hall, Ill.

Removal of carbon by the oxygen process in an air cooled engine is not injurious although precaution should be taken to prevent undue heat being generated in the combustion chamber, as most air cooled engines use aluminum alloy pistons which are more susceptible to high temperature than are the usual cast iron pistons. When burning the carbon, it is advisable to turn on enough oxygen to make the flames appear out of the valve ports or spark plug hole and then reduce the oxygen pressure until this flame just disappears and sparks appear through the hole.

End Play In Pinion Shaft Must Be Taken Out Before Adjusting Gears

Q—In a 1922 Lincoln car driven 4,000 miles a hum has developed which seems to be in the rear axle. We removed the rear axle cover plate and adjusted the gears according to instruction publish in *MOTOR AGE* some time ago, but the noise still remained. We then removed the cover plate again and took more pains with the adjustment until there seemed to be a perfect mesh the full depth of the teeth but still the hum remained the same as before.

In determining the mesh we did not paint teeth as suggested in *MOTOR AGE* but there was just enough grease on the teeth to show how the teeth were meshing. Could it be that the pinion shaft bearings are not adjusted properly or could it be that the sound is coming from some other place than the rear axle.

This hum is noticed on level pavement at a speed of from 20 to 25 miles per hour and particularly when the foot is suddenly removed from the accelerator so as to allow the car to drive the engine.—California Subscriber.

Several thousand miles running will often produce enough wear in the rear bearing which supports the differential pinion to allow a slight amount of end motion to the pinion shaft. It is accordingly considered advisable to take out any play in the pinion bearings which may exist.

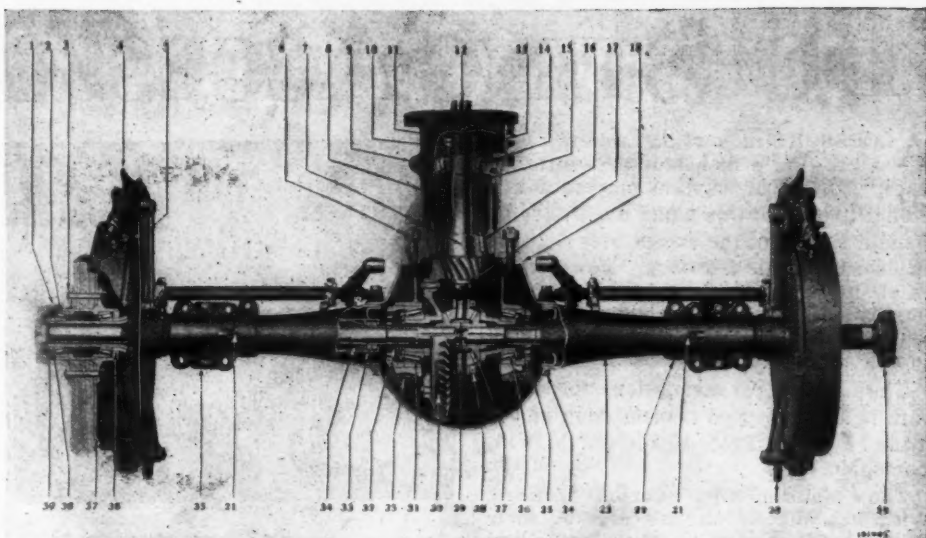
Referring to the illustration this is accomplished by removing the inspection plate No. 13 which also carries a projection which locks the pinion shaft bearing case. With this cover No. 13 removed it will be possible to tighten nut No. 10 until all play in the bearings is removed. The adjustment should be tight enough so that there is no perceptible end motion in the shaft but it should not be tight enough to cause the bearings to bind.

This adjustment might best be accomplished by dropping the rear universal, pulling out the axle driveshaft and removing the differential carrier housing No. 8 from the axle. Turning the shaft 12 as the pinion bearing adjusting nut No. 10 is tightened will then enable you to tell whether you have it too tight or not. Usually it can be tightened up until a slight bind is felt and then backed off just enough to allow the shaft to turn freely.

Special attention must be given to a locking washer located between the adjusting nut 10 and the jam nut 11. This is circumferentially grooved so that projections may be bent up and down to prevent relative motion between the adjusting nut and the jam nut.

After the pinion bearings are properly adjusted the meshing of the pinion and ring gear may be checked up and in moving the pinion the whole pinion shaft bearing case is rotated. Before this is done the lock bolt No. 9 must be loosened to allow the bearing case to turn in the housing.

While the method of using grease will give you some idea as to the meshing we believe you can determine conditions



more accurately if you will clean off the grease and use white paint as suggested in a previous *MOTOR AGE* article.

In making a running test on an axle to determine whether quiet operation has been obtained it is recommended that a special drive shaft be used which runs completely through the differential so as

to prevent getting a noise from the internal gears in the differential, which operate when there is a difference in rotation of the two wheels. Such a shaft would probably not be available in the average general repair shop but this method is doubtless available in any authorized Lincoln service station.

ACCESS TO TRANSMISSION BRAKE ON 1920 MERCER

Q—We have a 1920 4 cylinder Mercer, series 4. This car has a brake on the drive shaft at the rear of the transmission and apparently is enclosed in a steel drum. When the brake pedal is operated there is a noise like the bearings grinding or brake shoes rubbing on the steel drum. We can find no opening into this drum. How is it taken apart?

1—Access to this brake is had by removing the front universal and getting the propeller shaft out of the way. You will then find 10 studs with 10 nuts and when these nuts are removed the brake drum can be pulled straight back and off. Then if it is found that the drum is corrugated or scored due to wear from the brake lining it should be machined so as to again have a good surface. When you get the drum off you can then see what is wrong and will know what steps to take to correct the condition.

2—On this same car we have had some trouble with the engine missing. We are unable to get it to idle under 10 m.p.h., and when accelerating it misses up to a speed of 20 m.p.h. and then works and hits on all four cylinders up to 35 or 40, when it again begins to miss. We have checked up the magneto thoroughly and cannot make it miss at any speed on the test bench. Have also had new rings put in and valves resealed and found the compression to be good.

The car is equipped with a Ball & Ball carburetor, which was sent to the manufacturer, where it was completely overhauled. On receiving it again, however, the operation was no better than in the first place. A Zenith carburetor was also tried and worked better, but still missed at low speeds. Also with this carburetor the car would run no faster.—Ohio Subscriber.

2—While the trouble is possibly in carburetion it might be well to check the ignition first. The spark from the mag-

neto should jump about 3/16 inch in the air to make sure that it will jump 1/32 inch gap when under compression. It would also be well to inspect the high tension rubber covered wires leading from the magneto to the spark plugs to make sure that these are not worn and touching the engine so that the spark can jump through. These tests together with new spark plugs or plugs known to be operating satisfactorily will serve as a fairly complete check on the ignition.

This car was originally equipped with a hot-spot manifold but if this is not being used a hot-spot manifold of some sort should be installed. Another possibility is that you might get somewhat better operation by using 50 per cent Benzol and 50 per cent gasoline as a fuel instead of straight gasoline.

VALVE TIMING OF MODEL N HUPMOBILE

Q—Advise correct valve setting for model "N" Hupmobile engine to attain highest speed.—Bostic-Penny Garage, Malden, Mo.

The standard valve timing is such that the intake opens on top dead center and the exhaust closes 5 degs. after top dead center. It is doubtful whether a change from this setting will make possible any appreciable increase in speed, although sometimes advancing the camshaft gear one tooth will have some effect in this direction.

For really increasing the speed to any extent other changes are necessary and the nature of these you have doubtless observed in the columns of *MOTOR AGE* as instructions are frequently given on various cars.

BOOSTING ACCESSORY SALES

ACCESSORY makers and sellers report a growing demand for necessities on cars. The transportation merchant who would live up to this name must have on hand a supply of the accessories that are in demand in his territory. However, as in all lines, there is the danger of over-buying. Use your best judgment as to which things will move when you plan to buy a stock of accessories.

The Jumbo Transmission for Ford cars is a three speed transmission and is made by the Price-Hollister Co., St. Louis, Mo.

The Madison-Kipp Corp., Madison, Wis., has placed on the market their Oil-Kipp Oil in tubes. These tubes are heavy and collapsible, similar to those in which tooth pastes are packed. Each tube contains enough lubricant to take care of the average car's demands for a year. Being comparatively small, it is easy to carry the Oil-Kipp in the tool bag and have ready for use at any time.

The Sav-Oil ring, which is said by its manufacturers to give 1,000 miles to the gallon of oil is of one piece, cast individually from high quality soft grey iron. The two bevelled edges are designed to allow the ring to glide over a large portion of oil on the cylinder wall on the compression or up stroke of the piston. The two scraper edges carry the oil and return all excess to the oil reservoir on the downward stroke.

The groove in the center of the Sav-Oil ring always carries a supply of oil, which insures proper lubrication of the piston and cylinder at all times.

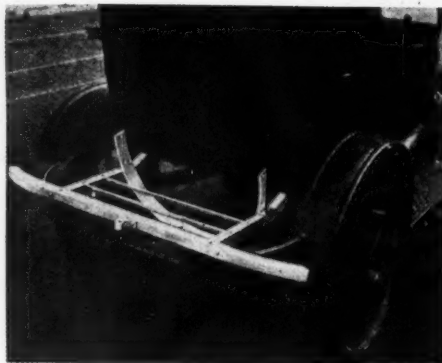
The fitting of this ring is the same as an ordinary step cut ring. It is placed in the third ring groove with the bevelled edge up. In installing, the directions call for the drilling of small holes in the pistons back of the ring at the lower corner of the groove.

The American Chain Co., Inc., Bridgeport, Conn., announces two additions to their line, namely, the Weed Bumper Arm Extension and the Weed License Brackets. The cut clearly illustrates the connection of the bumper arm extension to the bumper, making for more room and allowing two extra tires to be carried. The extension is made in two sizes only, for 2 in. or 2½ in. bars and sells at \$3.50 a set for either size.

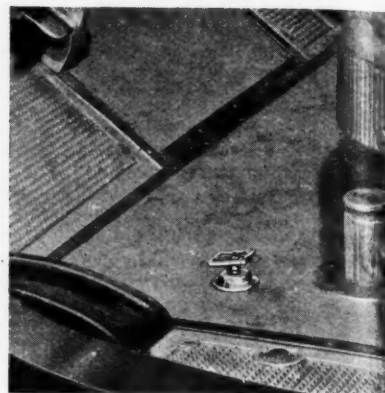
The Weed License Brackets are attached to the bumper, leaving the plate either above or below the bar as desired. The price of a set of brackets is 60 cents.

The Six-in-One Bumper combines the bumper, trunk rack, fender brace, tire rack, trailer hitch, license and light bracket. This bumper sells at \$15, at the factory, the Six-in-One Bumper Co., 1047 Security Bldg., Minneapolis, Minn.

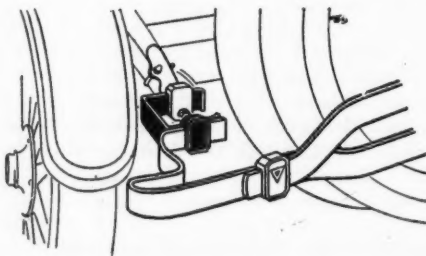
The El-Rock Head Light Dimmer is manufactured by El-Rock Dimmer Works, 300 N. Water Street, Rockford, Illinois. This device has four stages of



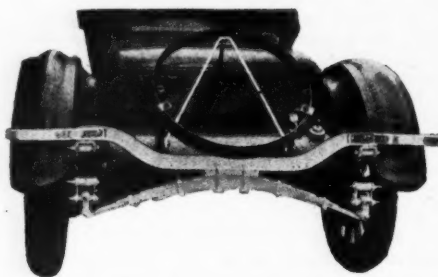
Six-in-One bumper



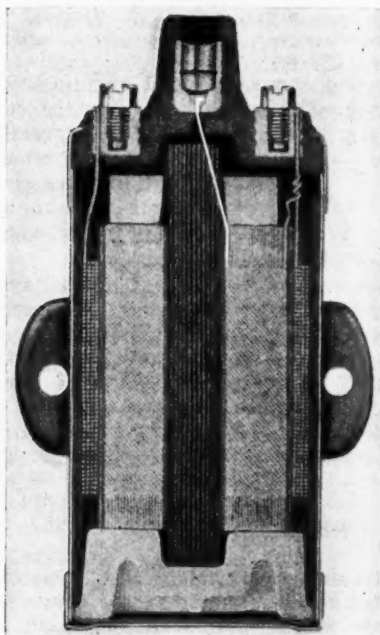
El Rock dimmer



Weed bumper arm extension



A. & B. platform spring for Dodge cars



Bosch ignition coil

dim—from the full strong light to dim, having two stages of dimness between bright and dim, and is operated entirely by the foot, so the hands are entirely free for driving.

By having four graduated stages of dimming, the after-glare or blinding light left when going directly from bright to dim is entirely eliminated.

The dimmer is very easily installed by drilling one hole in the floor board, as shown in the cut, and clamping with plates that are threaded to dimmer spindle, and cutting the head light wire and fastening the two ends to the connecting posts on the dimmer, which are on the bottom side of the floor board.

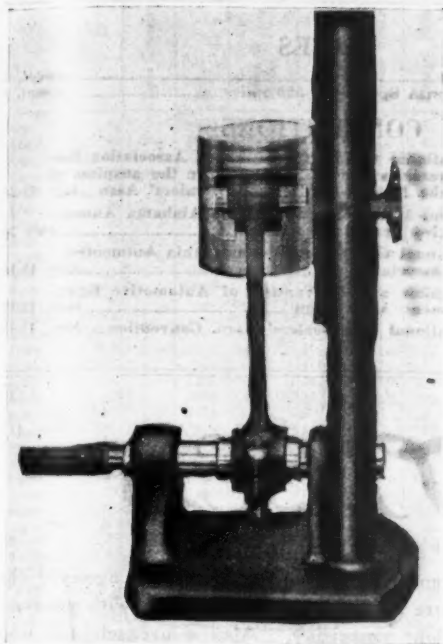
The type TG30 and TG40 ignition coil being put on the market by the American Bosch Magneto Corp., is constructed differently from the ordinary coil. The most noticeable difference is in locating the primary outside of the secondary so that the heat generated by the battery current may be more easily dissipated.

From the sectional illustration it will

be seen that the conventional iron core in the center is used, it being made up of very small iron wire. The magnetic circuit also includes two layers of iron wire located just inside the steel housing. These provide a return circuit for the magnetism. With this construction no ballast coil is needed. The coil is heated in a vacuum to remove all traces of moisture and is then impregnated with a sealing compound.

The A. & B. Platform Spring for Dodge cars is the product of the A. & B. Mfg. Co., 509 West Second street, Oklahoma City, Okla., and boasts of six distinctive features: three rebound leaves that provide for the rebound and prevent spring breakage; heavy tee cross member designed to carry heavy loads; fender guards that provide full rear bumper protection; special tire rack brace; cross member shackled to the upper springs and provided with means of lubrication; the two quarter rear springs are made more flexible. The price is \$35 installed.

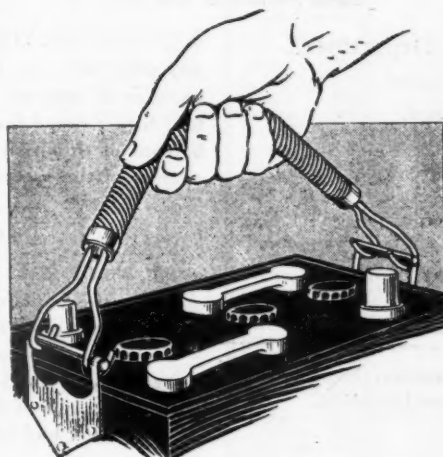
GETTING MORE OUT of the SHOP



Kwik-Way Straightening Rod Device



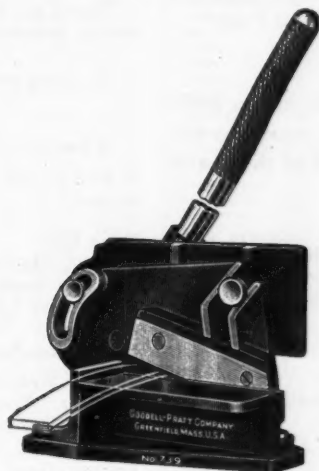
Challenge Grease Pump



Acco Battery Carrier



Union Air Compressor



Goodell-Pratt Brake Lining Cutter

THE other night in a Chicago transportation store, six sales were written into the books—two used cars and four new ones. There would seem to be nothing startling about that if it were not for the fact that each one of those buyers demanded, before purchasing to know "how the shop is equipped to take care of fast, accurate and economical work."

These sales were made on the strength of the shop, one man even going so far as to saunter back into the shop FIRST, without even looking at a car, and, after satisfying himself as to the fitness of the maintenance department, came out and

bought a used car. This will answer those who are still fooling themselves by saying "car owners don't care."

The Kwik-Way Straightening Rod Device will indicate any twists or bends to be found in connecting rods measuring from 5 in. to 15 in. on centers. The main body is of reenforced ribbed and cored grey iron, double heat treated so it will

not warp out of alignment after being machined. The main arbor is 1¼ in. in diameter and is made of alloy steel, hardened and ground. This arbor is of correct size to fit Ford rods. Bushings are carried in stock for larger rods and these bushings have reamed holes and are ground to size on the outside. One bushing of any size is furnished with the outfit. The upright portion of the tool is scraped straight and square with the arbor.—Cedar Rapids Engineering Co., Cedar Rapids, Ia.

Union Air Compressor, Model 100, is the product of the Union Equipment Co., Butler, Pa. This model, priced at \$70, is equipped with 11 in. tight and loose pulleys. It is two cylinder, two ins. bore, 2½ ins. stroke. The capacity is five cu. ft. air per minute at 500 r.p.m.

Chas. Bohannon Mfg. Co., Des Moines, Ia., have put on the market a grease pump, called the Challenger, which, according to the makers, will discharge from four to six pounds of grease or oils per minute, even in the coldest weather. The contents of the container are drawn into a cylinder setting one inch from the bottom and then discharged with a lifting force.

This arrangement provides increased suction power and as the lifting power is applied at the very bottom of the barrel, the pump, as stated, will handle any grease at any temperature.

The Acco Battery Carrier is the product of the American Chain Co., Bridgeport, Conn. The cut shows how it is hooked onto the battery, making it easier for the service man to lift the battery from the car and carry it to and from the test bench or work stand. The price is 50 cents.

Goodell-Pratt Co., Greenfield, Mass., announces its Brake Lining Cutter, No. 739. This machine, illustrated on this page, is designed to cut all widths and thicknesses of brake lining up to six ins. wide and one-half in. thick. The long handle exerts an unusually powerful shearing cut on the knife. The blades are hardened and tempered steel and, of course, removable. Polished steel, red and black enamel finish. The price is \$16.

The Allen Universal Test Stand, recently announced by the Allen Electric Mfg. Co., Detroit, Mich., is complete for testing all makes of starting motors, generators, ignition apparatus, magnetos, cutouts, ammeters and other electrical equipment. One new feature of this test stand is the method of mounting and driving the generator.

After a generator is mounted for driving, in the hardwood block and the motor elevated to the right height, the drive clutch is then slid into the flexible coupling. The adjustable clamp arm is so designed that it can be moved into any position on the generator.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Green Bay, Wis.	Annual Automobile Show	Aug. 27-30
Chicago	Commercial Vehicle Show	Sept. 1-7
Sacramento	Annual Automobile Show	Sept. 3-8
Indianapolis	Annual Fall Automobile and Accessory Show	Sept. 3-8
Memphis	Annual Automobile Show	Sept. 28-30
Fresno, Calif.	Automobile Show	Sept. 28-Oct. 5
New York	Annual Closed Car Show	Oct. 1-6
Little Rock, Ark.	Annual Automobile Show	Oct. 8-13
Chicago	Chicago Closed Car Show, Coliseum	Oct. 13-20
Dallas, Texas	Annual Fall Show	Oct. 13-23
Washington, D. C.	Closed Car Show	Oct. 20-27
Waco, Texas	Waco Automobile Dealers' Assn.	Oct. 28-Nov. 5
Washington, D. C.	Annual Fall Automobile Show	Oct. 28-31
New York	Foreign Automotive Association Exposition	Nov. 4-10
New York	Annual Salon, Hotel Commodore	Nov. 11-17
Chicago	Annual Salon, Drake Hotel	Jan. 26-Feb. 2, 1924
Dallas, Texas	Annual Automobile Show	Feb. 11-17, 1924

RACES

Pikes Peak Hill Climb	Sept. 3
Italy Monza Speedway, 500 miles	Sept. 9

CONVENTIONS

Chicago	National Conference of Trade Association Secretaries and Managers under the auspices of the National Automobile Dealers' Assn.	July 23-24
Mobile, Ala.	Semi-Annual Meeting of the Alabama Automotive Trades Association	July 23
Erie, Pa.	Annual Convention, Pennsylvania Automotive Association	Aug. 13-14
Chicago	Exhibit and Convention of Automotive Equipment Association	Nov. 12-17
New York	National Tire Dealers' Assn. Convention	Nov. 13-15

SQUEEKS & RATTLES

Send Some Sob Chasers

Squeeks & Rattles Merchandising Department

(Stick this under your accessory case glass)

The best of men have come to grief,
When, as they thought, they knew,
The ins and outs and whereabouts,
Of every nut and screw
That in their motor car are placed,
With many a secret knock,
So watch your step and save your pep,
We're here to save your jack.

—Useless.

Our Princess Pat wants to know if Saturation, Indignation, Cremation and Punctuation are related to Lew Brication. We'll bite—are they?

Dear Lew-nee: With the big fall in tire rates, I would suggest that we import a couple of tons of German marks, Austrian kronen, etc. Then we could talk business.—Universal Pete.

Favorite Agonies

The mechanic who cleans out the valves, grinds in the bearings and takes out the carbon to remove a knock caused by the starting crank striking the ratchet teeth in the end of the crank shaft.

The Finnegan-Woodburn Motor Co., Maxwell-Chalmers guys at Globe, Ariz., also have Indian customers. Herb Finnegan sends us this letter which was received from an Indian who had bought a used car from them some time ago. Even an Indian has his troubles with used cars.

"Dear Sir Mr. Wood Burns Motor Co. Say, Mr. Wood Burn, I'm going to sent you about \$5. if you get the money please let me know, if you please, Mr. Wood Burns. This payment for May, next payment for June 27, please don't worry, anyway. I'm always come up to pay you but to far for me to come so I just sent to you. Say, Mr. Wood Burn, I like to have a new car when my payment done. I think I get new car on July 30, so you think that is all right, Mr. Wood Burns. I spent so much on old car so I think about getting new car on July 30. I'm still working here at Mormon Flats, please answer back to me I like to here fore you, Mr. Wood Burn, so goodbye. I like to hear from you every once a week. Say, Mr. Wood Burn, my name is this now, no more Johnnie Cook, now but now my name is Johnnie Astor."

This is more than a whole lot of people would do, that we know of, even though the words are rough and the construction poor—it shows that Johnnie Astor is on the square and is not sore because he had to spend a lot of jack on his used car.

LYNN C. DOYLE enters this one for a favorite agony: The guy who tells you there can't be anything wrong with your car because it was all right yesterday. Also a greasehound who told him when he asked for water that there was "some in the bottom of that pail over there." Lynn wonders if there'd be a chance of the water being stuck to the sides of the bucket.

To "Kay Em" Roberts

Ah, that I could wield your pen, or, is it on the silvery key
You write your laughs at Kipling and at me?
For I have read and now I know the dangers and the snares
Of trading cars and getting caught so unawares.
Yea, I have read your masterpiece, called,
"Even as All of Us" and I would
That mine had been the fate to write it, if I could.

—One of the Thousands.

There ain't gonna be no fun in this if all of you don't get your mit in it somewhere.

Suppose you all get busy now and "Join the Club"?

What club? Squeeks & Rattles Club, of course—remember, if you're not a Brother Squeecker, anything is likely to happen to you.

Dear Ed:

Well, the big fight is over. Tell Paul Dumas that he can pay me that buck now any time, also the buck for the K. C. race. Sorry that I didn't get down to the race but the fight had all my attention. Those guys certainly slugged each other, all right. Nasty puncher that guy, Dempsey, eh?

Jack Kearns said he was sure that Jack would win and, well, did he? Tom was also as confident. Both men, however, are disqualified for membership in Squeeks & Rattles Club, because they didn't laugh once during the whole performance. Of course, there wasn't much to laugh at—I laughed once at a guy when he threatened to bust my nose but my nose is all right again, now.

It was a thrilling fight to look at right there at the ring-side. While Dempsey is some brick layer, one must confess that Tommy is no slouch—he wields a nasty meat hook and I'd sooner try to stop the Broadway Limited than to try stoppin' any one of those slams which were administered with such ceremony at Shelby.

But I'm back home now, and safe. I spent the Fourth in Wheaton and read all about the fight there, hence, I am able to give you this wonderful account of it.

LEW BRICATION.

Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE				REAR AXLE		TIRES	
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear
Ace.....30	1 1/2	\$2000	Mi-412	3 1/2x5	B-L	B-L	Ti-6560	WO.	34x3 1/2	34x5 1/2
Ace.....40	2 1/2	3250	Mi-402	4 1/2x5 1/2	B-L	B-L	Ti-6460	WO.	36x4 1/2	36x7 1/2
Ace.....60	3	3800	Mi-402	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4 1/2	36x8
Acme.....20	1 1/2	1800	Co-N	3 1/2x5	B-L	Cot.	Ti-6250	WO.	34x5 1/2	34x5 1/2
Acme.....30	1 1/2	2000	Co-N	3 1/2x5	B-L	Cot.	Ti-6352	WO.	34x3 1/2	34x5
Acme.....40	1 1/2	2200	Co-J4	3 1/2x5	B-L	Cot.	Ti-6460	WO.	34x3 1/2	34x5
Acme.....50	2 1/2	2400	Co-K4	4 1/2x5 1/2	B-L	Cot.	Ti-6560	WO.	36x4 1/2	36x7 1/2
Acme.....60	3	2600	Co-L4	4 1/2x5 1/2	B-L	Cot.	Ti-6660	WO.	36x5	40x10
Acme.....70	3 1/2	2800	Co-B5	4 1/2x5 1/2	B-L	Cot.	Ti-6760	WO.	36x5	40x12
Amer. La France	3 1/2	4950	Own.	4 1/2x5 1/2	Own.	Own.	Own.	WO.	36x5	36x5
Amer. La France	5	5500	Own.	4 1/2x5 1/2	Own.	Own.	Own.	WO.	36x6	40x6
Armstrong.....20	1 1/2	1800	Bu-CTU	3 1/2x5 1/2	Ful.	Ful.	Ti-6460	WO.	34x3 1/2	34x5 1/2
Armstrong.....30	2 1/2	2200	Bu-CTU	4 1/2x5 1/2	Ful.	Ful.	Ti-6560	WO.	36x4 1/2	36x7 1/2
Armstrong.....40	3	2400	Bu-CTU	4 1/2x5 1/2	Ful.	Ful.	Ti-6660	WO.	36x5	36x7 1/2
Armstrong.....50	3 1/2	2600	Bu-CTU	4 1/2x5 1/2	Ful.	Ful.	Ti-6760	WO.	36x5	36x7 1/2
Armstrong.....60	4	2800	Bu-CTU	4 1/2x5 1/2	Ful.	Ful.	Ti-6860	WO.	36x5	36x7 1/2
Armstrong.....70	4 1/2	3000	Bu-CTU	4 1/2x5 1/2	Ful.	Ful.	Ti-6960	WO.	36x5	36x7 1/2
Atlas.....25	1 1/2	1400	Bu-WTU	3 1/2x5 1/2	B-L	Own.	Own.	WO.	34x4 1/2	34x5 1/2
Atlas.....40	2 1/2	1950	Bu-WTU	4 1/2x5 1/2	B-L	Own.	Own.	WO.	36x4 1/2	36x5 1/2
Atterbury.....20	1 1/2	2475	Co-J4	3 1/2x5	Ful.	Ful.	Ti-6460	WO.	34x3 1/2	34x5
Atterbury.....22	1 1/2	2600	Co-K4	4 1/2x5 1/2	Ful.	Ful.	Ti-6560	WO.	36x4 1/2	36x5
Atterbury.....24	2 1/2	2800	Co-L4	4 1/2x5 1/2	Ful.	Ful.	Ti-6660	WO.	36x5	40x6
Atterbury.....26	3	3000	Co-B2	4 1/2x5 1/2	Ful.	Ful.	Ti-6760	WO.	36x5	40x7
Autocar.....21	1 1/2	2200	Own.	4 1/2x5 1/2	Own.	Own.	Own.	DR.	34x4	34x6
Autocar.....22	2 1/2	3100	Own.	4 1/2x5 1/2	Own.	Own.	Own.	DR.	34x5	36x8
Autocar.....24	3	4200	Own.	4 1/2x5 1/2	Own.	Own.	Own.	DR.	34x6	36x12
Available.....JH	1 1/2	2450	He-O	4x5	B-L	B-L	Ti-6460	WO.	36x3 1/2	36x5
Available.....H2	2 1/2	3160	He-CU3	4x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x8
Available.....H3	3 1/2	4175	He-MU3	4 1/2x5 1/2	B-L	B-L	Ti-6660	WO.	36x5	40x5d
Available.....H5	5	5375	He-T3	5x6	B-L	B-L	Ti-6760	WO.	36x6	40x12
Avery.....1-1 1/2	1 1/2	1800	Co-N	3 1/2x5	Ful.	Own.	To-OX2	IG.	34x5 1/2	34x5 1/2
Bessemer.....H2	1 1/2	1900	Co-N	3 1/2x5	Ful.	Own.	To-A	IG.	35x5 1/2	35x5 1/2
Bessemer.....H3	2 1/2	2800	Co-N	4 1/2x5 1/2	B-L	B-L	LM-7150	DR.	36x4 1/2	36x5
Bessemer.....K2	4	3495	Co-E7	4 1/2x5 1/2	B-L	B-L	LM-7250	DR.	36x4 1/2	36x4d
Bethlehem.....KN	1	1385	Own.	3 1/2x5	B-L	B-L	To-L	IG.	36x5	36x10
Bethlehem.....GN	2	2185	Own.	4 1/2x5 1/2	B-L	B-L	Det-1000	DR.	36x5 1/2	36x5 1/2
Bethlehem.....HN	3	2985	Own.	4 1/2x5 1/2	Ful.	Ful.	Wi-88E	DR.	36x4	36x8
Brockway.....E2	1 1/2	1800	Wi-SU	4x5	Ful.	B-L	Co-5200	SB.	33x5 1/2	33x5 1/2
Brockway.....S1	2 1/2	2400	Wi-SU	4x5	Ful.	B-L	Ti-6460	WO.	36x4	36x6
Brockway.....K2	3 1/2	3000	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x8
Brockway.....R3	4 1/2	3600	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6660	WO.	36x5	36x5d
Brockway.....T5	5 1/2	4200	Co-B5	4 1/2x5 1/2	B-L	B-L	Ti-6760	WO.	36x6	40x7d
Buick.....23-4-SD	3 1/2	945	Own.	3 1/2x5 1/2	Own.	Own.	SB.	31x4 1/2	31x4 1/2	31x4 1/2
Case.....TR	2	1800	Own.	3 1/2x5 1/2	TD.	Own.	To-C139	IG.	33x6 1/2	33x7 1/2
Chevrolet.....Sup'r	1 1/2	575	Own.	3 1/2x5	Own.	Mun.	Own.	SB.	31x4 1/2	31x4 1/2
Clydesdale.....10	1 1/2	1800	Co-N	3 1/2x5	B-L	B-L	Ti-5511	SB.	34x5 1/2	34x5 1/2
Clydesdale.....2 1/2	2 1/2	2400	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6460	WO.	36x4	36x7
Clydesdale.....3 1/2	3 1/2	2600	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x5	36x5d
Clydesdale.....4 1/2	4 1/2	2800	Co-B5	4 1/2x5 1/2	B-L	B-L	Ti-6660	WO.	36x6	40x6d
Clydesdale.....5 1/2	5 1/2	3000	Co-B5	4 1/2x5 1/2	B-L	B-L	Ti-6760	WO.	36x7	40x7d
Commerce.....9-1 1/2	1 1/2	1800	Co-N	3 1/2x5	B-L	B-L	Se-D16	SB.	32x4 1/2	32x4 1/2
Commerce.....14	2 1/2	2400	Co-J4	3 1/2x5	B-L	B-L	Ti-6460	WO.	36x4 1/2	36x5 1/2
Commerce.....25	3 1/2	3000	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x5	36x5d
Corbitt.....E1	1 1/2	1250	HS-700	3 1/2x5	B-L	B-L	Sh-100	WO.	34x3 1/2	34x4 1/2
Corbitt.....D1 1/2	2 1/2	1800	Co-N	3 1/2x5	B-L	B-L	Sh-100	WO.	34x3 1/2	34x4 1/2
Corbitt.....C2	3 1/2	2200	Co-J4	3 1/2x5	B-L	B-L	Sh-150	WO.	34x3 1/2	34x5 1/2
Corbitt.....B2 1/2	4 1/2	2300	Co-K4	4 1/2x5 1/2	B-L	B-L	Sh-103	WO.	36x3 1/2	36x7 1/2
Corbitt.....R3	5 1/2	3000	Co-L4	4 1/2x5 1/2	B-L	B-L	Sh-21	WO.	36x4 1/2	36x8
Corbitt.....A3 1/2	6 1/2	3300	Co-L4	4 1/2x5 1/2	B-L	B-L	Sh-21	WO.	36x4 1/2	36x8
Corbitt.....AA5	7 1/2	3600	Co-L4	4 1/2x5 1/2	B-L	B-L	Sh-32	WO.	36x5	36x10
Day-Elder.....AN 1 1/2	1 1/2	1800	Co-B5	4 1/2x5 1/2	B-L	B-L	Sh-51	WO.	36x6	40x12
Day-Elder.....BN 2 1/2	2 1/2	2400	Bu-WTU	3 1/2x5 1/2	B-L	B-L	Ti-6352	WO.	34x3 1/2	34x4 1/2
Day-Elder.....DN 3 1/2	3 1/2	2600	Co-J4	3 1/2x5	B-L	B-L	Ti-6460	WO.	34x3 1/2	34x5
Day-Elder.....FN 4 1/2	4 1/2	2800	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x7
Day-Elder.....EN 5 1/2	5 1/2	3000	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6660	WO.	36x5	36x5d
Dearborn.....E1	1 1/2	1800	Bu-YTU	3 1/2x5 1/2	B-L	B-L	Ti-6760	WO.	36x5	36x5d
Dearborn.....F1 1/2	2 1/2	2400	Bu-Ma	3 1/2x5 1/2	Ful.	Wi.	Wi.	WO.	35x5 1/2	35x5 1/2
Dearborn.....482	3 1/2	2900	Bu-WU	3 1/2x5 1/2	Ful.	Wi.	Wi.	WO.	34x4	34x5
Defiance.....G1	1 1/2	1525	Co-N	3 1/2x5	B-L	B-L	Se-1000	SB.	34x4 1/2	34x7
Denby.....31 1/2-1 1/2	1 1/2	1485	Co-N	3 1/2x5	Ful.	Ful.	Cl-B300	SB.	34x5 1/2	34x5 1/2
Denby.....332	2 1/2	2375	Co-J4	3 1/2x5	Ful.	Ful.	Cl-1D	IG.	35x5 1/2	36x7 1/2
Denby.....353	3 1/2	2975	Co-K4	4 1/2x5 1/2	Ful.	Ful.	Cl-2D	IG.	36x5	36x8
Denby.....274	4 1/2	3695	Co-L4	4 1/2x5 1/2	Ful.	Ful.	Cl-3D	IG.	36x5	36x5d
Denby.....2105	5 1/2	4295	Co-B5	4 1/2x5 1/2	Ful.	Ful.	Cl-5D	IG.	36x6	40x6d
Denby.....2147	6 1/2	4945	Co-B5	4 1/2x5 1/2	Ful.	Ful.	Ru	IG.	36x6	40x14
Dependable.....CD 1 1/2-2	1 1/2	2350	Bu-CTU	3 1/2x5 1/2	Ful.	Wi	Wi-800J	WO.	34x5	36x8
Dependable.....EG 2 1/2-3	2 1/2	2950	Bu-ETU	4 1/2x5 1/2	Ful.	Wi	Wi-900C	WO.	36x5	36x10
Diamond T.....O3 1 1/2-1 1/2	1 1/2	1800	Hi-700	3 1/2x5 1/2	Cov.	Cov.	Own.	WO.	36x3 1/2	36x4
Diamond T.....U2 2 1/2-2 1/2	2 1/2	2400	Hi-700	3 1/2x5 1/2	Cov.	Cov.	Ti-6460	WO.	36x3 1/2	36x5
Diamond T.....K3 3 1/2-3 1/2	3 1/2	2800	Hi-1400	4 1/2x5 1/2	Cov.	Cov.	Ti-6560	WO.	36x4 1/2	36x8 1/2
Diamond T.....EL5	4 1/2	3200	Hi-1500	4 1/2x5 1/2	Cov.	Cov.	Ti-6660	WO.	36x5	36x5d
Diamond T.....S5	5 1/2	3600	Co-B5	4 1/2x5 1/2	Cov.	Cov.	Ti-6760	WO.	36x6	40x6d
Dodge Brothers.....3 1/2	3 1/2	750	Own.	3 1/2x5 1/2	Own.	Own.	Own.	SB.	32x4 1/2	32x4 1/2
Dorris.....K-4 2 1/2	2 1/2	3400	Own.	3 1/2x5 1/2	Own.	Own.	Ti-6560	WO.	36x4	36x7
Dorris.....K-7 3 1/2	3 1/2	4000	Own.	4 1/2x5 1/2	Own.	Own.	Ti-6660	WO.	36x7	36x10
Dort.....109 1/2	1 1/2	685	Ly-K	3 1/2x5	Del.	Own.	FR-105	SB.	31x4 1/2	31x4 1/2
Double Dr. DFT3	3 1/2	4000	Bu-ETU	4 1/2x5 1/2	B-L	Own.	Own.	WO.	36x5	36x6
Duplex.....G1	1 1/2	1800	Bu-WTU	3 1/2x5 1/2	B-L	B-L	Ti-5511	SB.	33x5	33x5 1/2

* Make Optional
 † Short wheelbase model
 ‡ 6 cylinders
 § All 4 cyl. engines unless otherwise specified
 †† Truck Tractor
 ‡‡ Front wheel drive
 § price includes body or cab
 d dual
 k pneumatic tires optional at extra cost
 n pneumatic tires standard

ENGINE:
 Bu-Buda
 Co-Continental
 Ho-Dodge
 He-Hercules
 Hi-Hinkley
 HS-Herschell-Spiller
 Ly-Lycoming
 Mi-Midwest
 Wa-Waukesha
 We-Weidete
 Wi-Wisconsin

CLUTCH & GEARSET
 B-B-Borg & Beck
 B-L-Brown-Lipe
 Bak-Baker
 Cam-Campbell
 Cot-Cotta
 Cov-Covert
 Del-Detlaft
 Det-Detroit
 Ful-Fuller
 H-S-Hele-Shaw
 Hoo-Hoosier
 M&E-Merchant & Evans

Mec-Mechanics
 Mun-Muncie
 T.D.-Twin Disc
 War-Warner
 REAR AXLE:
 Am-American
 Cl-Clark
 Co-Columbia
 Du-Durston
 Ea-Eaton
 Fl-Flint
 LM-L-M

Ru-Russell
 Sa-Salisbury
 Sh-Sheldon
 Ti-Timken
 To-Torbenzen
 Wa-Walker
 Wi-Wisconsin
 Ch-Chain
 DR-Double Reduction
 IG-Internal Gear
 SB-Spiral Bevel
 SP-Straight Bevel
 WO-Worm

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	ENGINE				REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	ENGINE				REAR AXLE		TIRES		
		Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear	
Larrabee...X2	1-1 1/2	Co-SR...	3 3/4 x 4 1/2	B-L	B-L	Sh-1480	SB	34x5n	34x5n	Sandow...J	2 1/2	Co-C4...	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x7	
Larrabee...J4	1 1/2-2 1/2	Co-J4...	3 3/4 x 5	B-L	B-L	Sh-1501	WO	34x3 1/2	34x5k	Sandow...M5	4325	Co-B5...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12	
Larrabee...K5	2 1/2-3 1/2	Co-L4...	4 1/2 x 5 1/2	B-L	B-L	Sh-22...	WO	36x4	36x8	Sanford...10	1795	Co-SR...	3 3/4 x 4 1/2	B-L	B-L	Sh-1501	WO	36x3 1/2	36x5k	
Larrabee...L4	3 1/2-4 1/2	Co-L4...	4 1/2 x 5 1/2	B-L	B-L	Sh-31...	WO	36x5	36x10	Sanford...15	2150	Co-N...	3 3/4 x 5	B-L	B-L	Sh-1501	WO	36x3 1/2	36x5k	
Maccar...H2	1 1/2	Co-K4...	4 1/2 x 5 1/2	B-L	B-L	Ti-6460	WO	36x4	36x6	Sanford...25	3050	Co-C4...	4 1/2 x 5 1/2	B-L	B-L	Sh-31...	WO	36x4	36x4d	
Maccar...HA2	1 1/2	Co-K4...	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x4d	Sanford...35	3750	Co-E4...	4 1/2 x 5 1/2	B-L	B-L	Sh-31...	WO	36x5	36x5d	
Maccar...H23	1 1/2	Co-L4...	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x5d	Sanford...50	4550	Co-E4...	4 1/2 x 5 1/2	B-L	B-L	Sh-31...	WO	36x5	40x6d	
Maccar...M34	1 1/2	Co-L4...	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO	36x5	36x6d	Schacht...2	2500	Wi...	4x5	Ful.	Ful.	Wi...	DR.	36x3 1/2	36x7k	
Maccar...G5-6	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Schacht...3	3200	Wi-UAU	4 1/2 x 6	B-L	B-L	Own.	Own.	WO	36x4	36x7
MacDonald...O3-5	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Schacht...4	3800	Wi-UAU	4 1/2 x 6	B-L	B-L	Own.	Own.	WO	36x5	36x5d
MacDonald...A7 1/2	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Schacht...5	4400	Wi-UAU	4 1/2 x 6	B-L	B-L	Own.	Own.	WO	36x5	40x5d
Mack...AB 1 1/2	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Schacht...6	4600	Wi-UAU	4 1/2 x 6	B-L	B-L	Own.	Own.	WO	36x5	40x6d
Mack...AB 1 1/2	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Schacht...7	5050	Wi-UAU	4 1/2 x 6	B-L	B-L	Own.	Own.	WO	36x6	40x7d
Mack...AB 2	2 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Schwartz...20	1980	Wi-WFU	3 3/4 x 5 1/2	B-L	B-L	Ti-6250	WO	34x5n	34x5n	
Mack...AB 2	2 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Schwartz...45	2840	Bu-GTU	4x5 1/2	B-L	B-L	Ti-6460	WO	34x4	34x3 1/2	
Mack...AB 2 1/2	2 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Schwartz...65	3480	Bu-ETU	4 1/2 x 6	B-L	B-L	Ti-6560	WO	34x5	34x5d	
Mack...AB 2 1/2	2 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Schwartz...90	4160	Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6666	WO	36x6	36x6d	
Mack...AB 2 1/2	2 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Schwartz...120	4890	Bu-BTU	5 x 6 1/2	B-L	B-L	Ti-6760	WO	36x6	36x7d	
Mack...AC 3 1/2	3 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Selden...30C	2375	Co-N...	3 3/4 x 5	B-L	B-L	Ti...	WO	34x3 1/2	34x5k	
Mack...AC 3 1/2	3 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Selden...50B	3250	Co-K4...	4 1/2 x 5 1/2	B-L	B-L	Ti...	WO	36x4k	36x7k	
Mack...AC 3 1/2	3 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Selden...50B	3550	Co-L4...	4 1/2 x 5 1/2	B-L	B-L	Ti...	WO	36x4k	36x7k	
Mack...AC 3 1/2	3 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Selden...70B	4175	Co-L4...	4 1/2 x 5 1/2	B-L	B-L	Ti...	WO	36x5k	36x10k	
Mack...AC 3 1/2	3 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Selden...73	4475	Co-B5...	4 1/2 x 6	B-L	B-L	Ti...	WO	36x5k	36x10k	
Mack...AC 3 1/2	3 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Selden...90A	4950	Co-B5...	4 1/2 x 6	B-L	B-L	Ti...	WO	36x6k	40x12	
Mack...AC 10	10	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Service...12	34	Mi-410	3 3/4 x 4 1/2	Del.	Det.	Ti-5311	SB	32x4 1/2	32x4 1/2	
Mack...AC 13	13	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Service...25	114	Bu-WTU	3 3/4 x 5 1/2	B-L	B-L	En-1000	SB	34x5n	34x5n	
Mack...AC 15	15	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Service...33	146	Bu-GBU	4 x 5 1/2	B-L	B-L	Ti-6352	WO	34x3 1/2	34x6	
Mason...1 1/2	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Service...42	22	Bu-EBU	4 1/2 x 5 1/2	B-L	B-L	Ti-6460	WO	36x4	36x7	
Master...11 1/2	11 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Service...61	33	Bu-EBU	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x8	
Master...21 1/2	21 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Service...72	33 1/2	Bu-EBU	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO	36x5	36x5d	
Master...41 1/2	41 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Signal...103	6	Bu-YBU	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	
Master...51 1/2	51 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Signal...NF	13 1/2	Co-J4...	3 3/4 x 5	B-L	B-L	Ti-6352	WO	34x5n	36x6n	
Master...61 1/2	61 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Signal...H	23 1/2	Co-K4...	4 1/2 x 5 1/2	B-L	B-L	Ti-6460	WO	34x4	36x6	
Master...64 1/2	64 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Signal...J	33 1/2	Co-K4...	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	34x4	36x8	
Maxwell...1 1/2	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Signal...M5	7	Co-L4...	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO	36x5	40x10	
Menominee...B1	1	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Signal...R	7 1/2	Co-B5...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x12	
Menominee...HT 1 1/2	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Standard...75	13301	Co-N...	3 3/4 x 5	B-L	B-L	Ti-6250	WO	33x5n	33x5n	
Menominee...H1 1/2	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Standard...1 1/2	1695	Co-N...	3 3/4 x 5	B-L	B-L	Ti-6352	WO	34x3 1/2	34x5	
Menominee...D2-2 1/2	2 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Standard...2 1/2	2795	Co-K4...	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4	36x8	
Menominee...J5	5	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Standard...3 1/2	3645	Co-L4...	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO	36x5	36x12	
Moline...10 1/2	10 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Standard...5K	4495	Co-B5...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x14	
Moreland...R.R. 1	1	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Star...1 1/2	610n	Co-B5...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x14	
Moreland...BX 1 1/2	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Sterling...1 1/2	3240	Wa-FU...	4x5 1/2	B-L	B-L	Ti-6460	WO	36x3 1/2	36x5k	
Moreland...EX 2	2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Sterling...2 1/2	3440	Wa-FU...	4x5 1/2	B-L	B-L	Ti-6560	WO	36x4k	36x4dk	
Moreland...AX 3	3	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Sterling...2 1/2	3707n	Wa-CU...	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO	36x4k	36x4dk	
Moreland...RX 5	5	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Sterling...3 1/2	4750	Wa-DU...	4 1/2 x 6 1/2	H-S	Own	Ti-6660	WO	36x5	40x5d	
Nash...2018 1-1 1/2	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Sterling...5	5407n	Wa-EU...	5x6 1/2	H-S	Own	Ti-6760	WO	36x6	40x6d	
Nash...4017F 2-2 1/2	2 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Sterling...5	6000	Wa-EU...	5x6 1/2	H-S	Own	Ti-6760	WO	36x6	40x6d	
Nash...3018 2-2 1/2	2 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Sterling...7 1/2	6500	Wa-EU...	5x6 1/2	H-S	Own	Ti-6760	WO	36x6	40x7d	
Nash...5018 2 1/2	2 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Stewart...16	990	Co-N...	3 3/4 x 5	B-L	B-L	Ti-6760	WO	36x6	40x7d	
Noble...A7S1	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Stewart...15-X	14	Bu-MU...	3 3/4 x 5 1/2	B-L	B-L	Ti-6760	WO	36x6	40x7d	
Noble...A-21 1-1 1/2	1 1/2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760	WO	36x6	40x6d	Stewart...9	1870	Co-N...	3 3/4 x 5	B-L	B-L	Ti-6760	WO	36x6	40x7d	
Noble...B-31 1 1/2-2	2	Co-B2...	4 1/2 x 6	B-L	B-L	Ti-6760</														

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE			REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	Price	ENGINE			REAR AXLE		TIRES			
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front				Rear	Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear
CANADIAN																					
Walter.....N2	12	\$3600	Ow.....	4x5 1/2	B-L.	B-L.	Ow.....	DR.	36x4	36x8	Gotfredsen.....20	34-1	\$1685	Bu-WTU	3x5 1/2	B-L.	B-L.	Ti-6250.	WO.	34x5n	34x5n
Walter.....S5	15	5100	Ow.....	4x5 1/2	B-L.	War.	Ow.....	DR.	36x6	40x6d	Gotfredsen.....40	1 1/2-2	2300	Bu-GTU	4x5 1/2	B-L.	B-L.	Ti-6460.	WO.	36x6n	38x7n
White.....15 3/4	15	2400	Ow.....	3x5 1/2	Ow.	Ow.	Ow.....	SP.	34x5n	34x5n	Gotfredsen.....50	2 1/2	3000	Bu-EU.	4x5 1/2	B-L.	B-L.	Ti-6560.	WO.	36x4	36x8
White.....20 1/2	20	3250	Ow.....	3x5 1/2	Ow.	Ow.	Ow.....	DR.	36x4	36x7d	Gotfredsen.....80	1	3975	Bu-YTU	4x5 1/2	B-L.	B-L.	Ti-6666.	WO.	34x5	36x12
White.....40 3/4	40	4200	Ow.....	4x5 1/2	Ow.	Ow.	Ow.....	DR.	36x5	40x5d	Gotfredsen.....100	5	4800	Bu-BTU	5x5 1/2	B-L.	B-L.	Ti-6760.	WO.	36x6	40x14
White.....45 1/2	45	4500	Ow.....	4x5 1/2	Ow.	Ow.	Ow.....	DR.	36x6	40x6d	Mapleleaf.....11 1/2	1	3000	Hi-300.	3x5 1/2	Ful.	Ful.	Sh-1501.	WO.	34x5n	36x6n
Wilcox.....AA 1	1900	Bu-CTU	3x5 1/2	B-L.	B-L.	Ru-3600.	SP.	35x5	35x5	Mapleleaf.....AA 2	2	3600	Hi-400.	4x5 1/2	Ful.	Ful.	Sh-103.	WO.	36x4	36x7	
Wilcox.....BB 1 1/2	2550	Ow.....	4x5 1/2	B&B.	Ow.	Wa-2A.	DR.	36x6k	38x7k	Mapleleaf.....BB 3	3	4050	Hi-500.	4x5 1/2	Ful.	Ful.	Sh-21.	WO.	36x4	36x4d	
Wilcox.....CC 2 1/2	3350	Ow.....	4x5 1/2	B&B.	Ow.	Wa-25A.	DR.	36x6k	40x8k	Mapleleaf.....CC 1	1	4800	Hi-200.	4x5 1/2	Ful.	Ful.	Sh-31.	WO.	36x5	36x5d	
Wilcox.....EE 3 1/2	3950	Bu-YTU	4x5 1/2	M&E.	Ow.	Wa-5A.	DR.	36x5	36x10	Mapleleaf.....DD 5	5	5325	Hi-1600.	4x5 1/2	Ful.	Ful.	Sh-51.	WO.	36x6	36x6d	
Wilson.....F5	4350	Bu-ATU	4x5 1/2	M&E.	Ow.	Wa-5A.	DR.	36x5	40x5	National.....FA 1	1	.....	Wa-BUX	3x5 1/2	B-L.	B-L.	Ti-6352.	WO.	35x5n	35x5n
Wilson.....CI 1	1350	He-O.	4 x 5	B&B.	Det.	Ti-6532.	WO.	34x5n	34x5n	National.....GA 1 1/2	1 1/2	.....	Wa-BUX	3x5 1/2	B-L.	B-L.	Ti-6460.	WO.	34x4k	34x6k
Wilson.....F 1 1/2	2270	Co-J4.	3x5 1/2	B&B.	Cot.	Ti-6460.	WO.	36x3 1/2	36x5k	National.....HD 2 1/2	2 1/2	.....	Wa-CU.	4x5 1/2	H-S.	B-L.	Ti-6560.	WO.	36x5	36x10
Wilson.....EA 2 1/2	2825	Co-K4.	4x5 1/2	B&B.	Cot.	Ti-6560.	WO.	36x4k	36x7k	National.....NB 3 1/2	3 1/2	.....	Wa-DU.	4x5 1/2	H-S.	B-L.	Ti-6666.	WO.	36x6	40x12
Wilson.....G 3 1/2	3685	Co-L4.	4x5 1/2	B&B.	Cot.	Ti-6660.	WO.	36x5k	36x5d	National.....OA 5	5	2699	Wa-EU.	5x6 1/2	H-S.	B-L.	Ti-6760.	WO.	36x7	40x14	
Wilson.....H 5	4520	Co-B2.	4x5 1/2	B&B.	Cot.	Ti-6752.	WO.	36x6k	40x6d	Veteran.....M 1 1/2	1 1/2	3999	Bu-CTU	3x5 1/2	B&B.	Cot.	Sh-1501.	WO.	34x5n	34x5n	
Yellow Cab.....M22 3/4	1590	Co-V4.	3x5 1/2	B-L.	B-L.	Ti-6752.	SB.	33x4 1/2	33x4 1/2	Veteran.....P 2	2	4200	Bu-HTU	4x5 1/2	B&B.	Cot.	Sh-21.	WO.	36x4	36x7	
Yellow Cab.....M42 1 1/4	1640	Co-V4.	3x5 1/2	B-L.	B-L.	Ti-6352.	WO.	35x5n	35x5n	Veteran.....R 3	3	5395	Bu-HTU	4x5 1/2	B&B.	Cot.	Sh-21.	WO.	36x4	36x7	
										Veteran.....S 1	1	5395	Bu-YTU	4x5 1/2	B&B.	Cot.	Sh-31.	WO.	36x5	36x10	

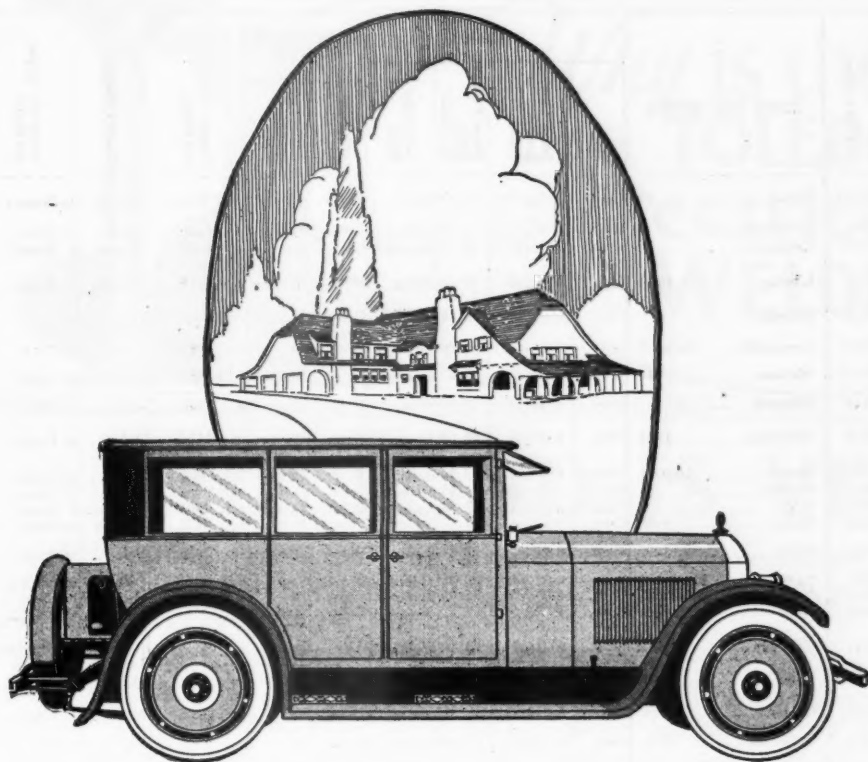
Current Tractor Specifications

MAKE & MODEL	Drawbar-Pulling Rating	Recommended No. of 14 Ins. Plovs	ENGINE				Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulling Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE				Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)					
			Make	No. of Cyls. Bore & Stroke	Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)							Make	No. of Cyls. Bore & Stroke	Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)							
Allis-Chalmers.....	6-12	1	\$295	LeR.	4-3 1/2 x 4 1/2	2500	48x6	Gray.....DU	18-36	4	2150	Wau.	4-4 1/2 x 6 1/2	6190	.....	Rumely OilPull	30-60	8-10	.....	Ow.	2-10x12	26700	80x30
Allis-Chalmers.....	15-25	3	1185	Mid.	4-4 1/2 x 5 1/2	4700	48x12	Gray.....EU	22-40	4	2385	Wau.	4-5 x 6 1/2	6900	.....	Russell	15-30	3-4	.....	Chi.	4-5 x 6 1/2	6000	56x14
Allis-Chalmers.....	20-35	4	1835	Ow.	4-4 1/2 x 6 1/2	6150	50x12	Hart-Parr.....20	20	2	.....	Ow.	2-5 1/2 x 6 1/2	3973	46x10	Russell	20-40	4-5	.....	Chi.	4-5 1/2 x 7	7900	60x16
Allwork.....D	20-38	4-5	1695	Ow.	1-5 x 7	6500	48x14	Hart-Parr.....30	30	3	.....	Ow.	2-6 1/2 x 7	5221	52x10	Russell	30-60	8-10	.....	Ow.	4-8 x 10	22550	84x22
Allwork.....C	16-30	3	1495	Ow.	1-4 1/2 x 6	4800	48x12	Hart-Parr.....Road	30	3	.....	Ow.	2-6 1/2 x 7	7531	52x18	Shaw-Enochs (Gr.)	.....	.....	LeR.	4-3 1/2 x 4 1/2	4400	48x8	
Allwork.....G	16-30	3	1293	Ow.	1-5 x 6	5200	48x12	Heider.....D	9-16	2	.....	Wau.	4-4 1/2 x 5 1/2	4011	51x8	Topp-Stewart.....B	37-45	4	.....	Wau.	4-4 1/2 x 6 1/2	7800	42x12
Aultman-Taylor.....	15-30	3-4	1900	Chi.	1-5 x 6 1/2	7800	70x12	Heider.....C	12-20	3	.....	Wau.	4-4 1/2 x 6 1/2	6171	57x10	Toro.....	6-10	2	\$675	LeR.	4-3 1/2 x 4 1/2	2900	41x9
Aultman-Taylor.....	22-45	4-6	3100	Ow.	1-5 1/2 x 8	12500	70x20	Heider.....M	5-10	3	.....	LeR.	4-3 1/2 x 1 1/2	2371	46x6	Townsend.....	10-20	2-3	809	Ow.	2-6 1/2 x 7	4500	48x12
Aultman-Taylor.....	30-60	8-10	4400	Ow.	1-7 x 9	22500	90x24	Huber.....(Light 4)	12-25	3	985	Wau.	4-4 1/2 x 5 1/2	5001	60x10	Townsend.....	15-30	3-4	1350	Ow.	2-7 x 8	6500	56x18
Avery.....15	3-4	1	1000	Ow.	1-4 1/2 x 6	4750	50x12	Huber.....(Super 4)	15-30	3	.....	Mid.	4-4 1/2 x 6 1/2	6091	60x10	Townsend.....	25-50	4-8	2500	Ow.	2-8 1/2 x 10	11500	60x24
Avery.....20-35	4-5	2	1500	Ow.	1-4 1/2 x 7	7500	60x16	LaCrosse.....M	6-12	1	.....	Ow.	2-4 x 6	3971	48x7	Traylor.....	6-12	1	500	LeR.	4-3 1/2 x 4 1/2	1750	38x10
Avery.....25-50	5-6	3	2000	Ow.	1-6 1/2 x 7	12500	69x20	LaCrosse.....H	12-24	3	.....	Ow.	2-6 x 7	3971	56x10	Twin City.....	12-20	3	1200	Ow.	1-4 x 6	5000	50x12
Avery.....45-65	8-10	5	3000	Ow.	1-7 1/2 x 8	22000	87 1/2 x 24	Lauson.....S	12-25	3	.....	Mid.	4-4 1/2 x 5 1/2	4200	.....	Twin City.....	20-35	5	2750	Ow.	4-5 1/2 x 6 1/2	9200	60x20
Avery.....Tr. Runner	3	.....	.....	Ow.	1-4 x 5 1/2	5000	x 8 1/2	Lauson.....T	15-30	4	.....	Bea.	4-4 1/2 x 6 1/2	6200	.....	Twin City.....	10-65	8	1750	Ow.	1-7 1/2 x 9	24000	84x24
Avery.....Road Racer	3	.....	.....	Ow.	6-3 x 4	4800	42x6	Leader.....T	12-18	2	.....	Ow.	2-6 1/2 x 6	4800	50x12	Uncle Sam.....C-20	12-20	2-3	991	Wel.	1-4 x 5 1/2	3000	46x12
Bates (St. Mule) H.....	15-25	3	.....	Mid.	4-4 1/2 x 5 1/2	3600	48x10	Leader.....N	16-32	3-4	.....	Chi.	4-5 x 6	5800	52x12	Uncle Sam.....B-19	20-30	3-4	1535	Bea.	4-4 1/2 x 6	4650	50x12
Bates (St. Mule) F.....	18-25	3	.....	Mid.	4-4 1/2 x 5 1/2	4850	56x10	Leader.....GU	16-32	3-4	.....	Chi.	4-5 x 6	666 x 9	.....	Uncle Sam.....D-21	20-30	3-4	1485	Bea.	4-4 1/2 x 6	4600	50x12
Bates (St. Mule) G.....	25-35	4	.....	Mid.	4-4 1/2 x 6	6500	x 10	Lincoln.....A	15-30	3	1600	Bud.	4-4 1/2 x 6	5000	40x14	Wallis.....OK	15-27	3	.....	Ow.	1-4 1/2 x 5 1/2	3630	48x12
Bates (St. Mule) G.....	40-70	4	.....	Mid.	4-4 1/2 x 6	8500	64x10	Little Giant.....B	16-22	4	.....	Ow.	4-4 1/2 x 5	5200	51x14	Waterloo Boy.....N	12-25	3	.....	Ow.	2-6 1/2 x 7	5869	52x12
Best.....B	25-35	4	1250	Mid.	4-4 1/2 x 6 1/2	5500	64x12	Little Giant.....A	26-35	6	.....	Ow.	4-4 1/2 x 6	8700	66x20	Wetmore.....	12-25	3	1185	Wau.	4-4 x 5 1/2	2900	46x10
Best.....30-40	4	.....	.....	Ow.	4-4 1/2 x 6 1/2	8100	68x11 1/2	Lombard.....	100	12-16	.....	Ow.	6-5 1/2 x 7	19000	x 12	Wisconsin.....	16-30	3-4	1750	Chi.	4-5 x 6 1/2	5600	52x12
Best.....60-100	9	.....	.....	Ow.	4-6 1/2 x 8	18580	89x20	London.....	12-25	3	.....	Mid.	4-4 1/2 x 5 1/2	.....	48x12	Wisconsin.....	22-40	4-5	2550	Chi.	4-5 1/2 x 7	7500	52x12
Bryan.....Steam	15-30	3	2500	Ow.	2-4 x 5	5500	52x12	McCork-Deering.....	10-20	2	785	Ow.	4-4 1/2 x 5	3709	42x12	Yuba (Ball Tread).....	15-25	3	2750	Wis.	4-4 1/2 x 6	5750	36x12
Case.....12-20	3	1095	Ow.	4-4 x 5	4230	42x12	McCork-Deering.....	15-30	3	1250	Ow.	4-4 1/2 x 6	5750	50x12	Yuba (Ball Tread).....	25-40	6	4250	Wis.	4-5 1/2 x 7	10130	48x17 1/2	
Case.....15-27	3-4	1350	Ow.	4-4 x 6	6600	52x14	Minneapolis.....	12-25	3	.....	Ow.	4-4 1/2 x 7	6600	56x12									
Case.....22-40	4-5	2650	Ow.	4-5 1/2 x 6 1/2	10700	56x16	Minneapolis.....	17-30	3-4	.....	Ow.	4-4 1/2 x 7	6100	51x12									
Case.....40-72	8-10	4900	Ow.	4-7 x 8	21200	72x20	Minneapolis.....	22-44	4-5	.....	Ow.	4-6 x 7	12119	62x20									
Caterpillar.....2 Ton	15	3	1975	Ow.	1-4 x 5 1/2	4000		Minneapolis.....	35-70	8-10	.....	Ow.	4-7 1/2 x 9	22500	85x30								
Caterpillar.....5 Ton	25	4	3975	Ow.	4-4 x 6 1/2	9400		Moline (Un.).....D3	9-8	3	725	Ow.	4-3 1/2 x 5	4103	52x8	Aro.....F	3-6	1	\$385	Ow.	1-4 1/2 x 5	1000	30x4
Caterpillar.....10 Ton	40	6	6050	Ow.	4-6 1/2 x 7	19500		Moline (Orc.).....D	9-8	3	725	Ow.	4-3 1/2 x 5	3893	44x8	Beeman.....K	1 1/2-1	1	265	Ow.	1-3 1/2 x 4 1/2	550	25 1/2 x 3 1/2
Cletrac.....F	9-16	2	745	Ow.	4-3 1/2 x 4 1/2	1930	42x 5 1/2	Monarch.....C	20-30	4	3800	Bea.	4-4 1/2 x 6	8700	66x12	Bolens.....	1	180	B.&S.	1-2 1/2 x 19	190	10x3	
Cletrac.....W	12-20	2	1345	Ow.	4-4 x 5 1/2	3455	48x8	Monarch.....E	25-40	4	4350	Bea.	4-4 1/2 x 6	12000	67x12	Centaur.....1923	2 1/2-5	1	315	N.W.	1-4 1/2 x 4 1/2	700	28x4
Eagle.....F	12-22	3	.....	Ow.	2-7 x 8	5850	48x12	Monarch.....D	35-60	6	5750	Bea.	6-6 1/2 x 8	15000	69x12	Do-It-All.....(Baby)	2 1/2-6	1	395	Ow.	1-3 1/2 x 3 1/2	750	
Eagle.....H	16-30	4	.....	Ow.	2-8 x 8	9100	48x12	Nichols-Shepard.....	20-42	4-6	2600	Ow.	2-8 1/2 x 10	15000	61x20	Do-It-All (Jack).....	2 1/2-6	1	495	Ow.	1-4 1/2 x 5	1200	26x 2 1/2
E-B.....AA	12-20	3	.....	Ow.	4-4 1/2 x 5	4550	54x12	Nichols-Shepard.....	25-50	6-8	3320	Ow.	2-9 1/2 x 12	20500	69x28	Do-It-All (Twins).....	4-15	1	495	Ow.	2-3 1/2 x 3 1/2	800	
E-B.....BB	16-30	4	.....	Ow.	4-4 1/2 x 5	6500	60x12	Nichols-Shepard.....	35-70	8-12	4030	Ow.	2-10 1/2 x 30000	73x20	Kinkade.....	1 1/2-3	1	190	Ow.	1-5 x 3	190	22x 5 1/2	
E-B.....Q	16-32	4	.....	Ow.	4-5 1/2 x 7	9400	72x16	Pioneer.....G	18-36	.....	.....	Ow.	4-5 1/2 x 6	6500	60x18	M.B.M. Red.....E	1 1/2-3	250	Ow.	1-3 1/2 x 4	410	20x 3	
Fagool.....	19-12	2	1175	Lye.	4-3 1/2 x 5	3800	48x 8 1/2	Pioneer.....C	10-15	4	.....	Ow.	4-7 x 8	24000	96x24	Motor Maculaturator.....	.....	.....	148	Ow.	1-2 1/2 x 3 1/2	210	19 1/2 x 3
Fordson.....	-18	2	395	Ow.	4-4 x 5	2543	42x12	Rumely OilPull.....	12-20	3	.....	Ow.	2-6 x 8	6682	51x12	N.B.....	2	6	175	Ow.	2-2 1/2 x 4	750	32x4
Frick.....A	12-20	2	1000	Erd.	4-4 x 6	5800	60x10	Rumely OilPull.....	16-30	4	.....	Ow.	2-7 x 8 1/2	9600	56x16	Utilitor.....501	2 1/2-4	1	295	Ow.	1-3 1/4 x 4	750	24 1/2 x 4
Frick.....C	15-28	3	1600	Erd.	4-4 1/2 x 6	6730	60x12	Rumely OilPull.....	20-40	6	.....	Ow.	2-8 x 10	12820	64x20	Utilitor.....501A	2 1/2-4	1	340	Ow.	1-3 1/4 x 4 1/2	925	24 1/2 x 4

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES							Wheel Base (Ins.)	Tire Size (Ins.)	NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM			Clutch Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE		
OPEN MODELS			CLOSED MODELS							Make	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make				Type and Make	Gear Ratio	
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.															
\$1950c	\$1785	\$1850	\$1885c	\$2250	\$2485		127	33x4 1/2	American.....D-66	H-S.	6-3 1/2x5	29.40	Strom.	G-D.	A-K.	s-p	B&B.	B & B.	m Hartford.	F Salis.	4.50
	1195		1395c		1905	d1795p	114	32x4	Anderson.....41	Cont.	6-3 1/2x4 1/2	23.44	Zenith.	West.	West.	s-p	B&B.	Durston.	f Universal.	3/2 F Salis.	4.75
1495	1495	1595	1785b	1905c	1995d		122	32x4	Anderson.....Series 50	Cont.	6-3 1/2x4 1/2	27.34	Rayfield.	Remy.	Remy.	s-p	B&B.	Durston.	f Universal.	3/4 F Salis.	4.62
			1915c				132	33x4	Anderson.....Series 50	Cont.	6-3 1/2x4 1/2	27.34	Rayfield.	Remy.	Remy.	s-p	B&B.	Durston.	f Universal.	3/4 F Salis.	4.62
	1535				2200		130	32x4	Apperson.....6	Own.	6-3 1/2x4 1/2	23.44	Strom.	Remy.	Remy.	s-p	Rockford.	Mech.	m Thieme.	3/2 F Col.	5.09
	2800	2900			3750	\$3850	130	33x5	Apperson.....8-23-5	Own.	8-3 1/2x5	33.80	Johnson.	Bijou.	Remy.	m-d	Own.	Own.	m Thieme.	3/2 F Own.	4.25
	1165		1275d		1535		114	31x4	Auburn.....6-43	Cont.	6-3 1/2x4 1/2	23.44	Strom.	Remy.	Remy.	s-p	B&B.	Warner.	m Detroit.	3/2 F Col.	4.60
	1725		1985d		2045f	2345	122	32x4 1/2	Auburn.....6-63	Own.	6-3 1/2x5	25.35	Strom.	Remy.	Remy.	s-p	B&B.	Warner.	m Thieme.	3/2 F Col.	4.60
	1395		145d		1850		118	32x4	Barley.....	Cont.	6-3 1/2x4 1/2	23.44	Strom.	Delco.	Delco.	s-p	B&B.	Fuller.	f M&E.	3/2 F Col.	5.10
			12250p																		
885	885	725a	1025b	1175	1395		109	31x4	Buick.....34-5-6-7-8-39	Own.	4-3 1/2x4 1/2	18.23	Marvel.	Delco.	Delco.	m-d	Own.	Own.	m Own.	3/2 F Own.	4.66
					1325																
1175	11.5	975a		1935	1985		118	32x4	Buick.....41-4-5-47	Own.	6-3 1/2x4 1/2	27.34	Marvel.	Delco.	Delco.	m-d	Own.	Own.	m Own.	F Own.	4.10
			1435	1625a	1895	2195	124	33x4 1/2	††Buick.....45-9-50-4-55	Own.	6-3 1/2x4 1/2	27.34	Marvel.	Delco.	Delco.	m-d	Own.	Own.	m Own.	F Own.	4.70
			1675c																		
2885	2885	2885		3675c	3950	4300f	132	33x5	Cadillac.....61	Own.	8-3 1/2x5 1/2	31.25	Own.	Delco.	Delco.	m-d	Own.	Own.	m Spicer.	F Tim.	Opt.
					375f																
1750	1790		2230d	2430c	2575	2840	122	32x4 1/2	Case.....X	Cont.	6-3 1/2x4 1/2	27.34	Rayfield.	Delco.	Delco.	m-d	Own.	Own.	f Sneed.	3/2 F Col.	5.09
			199f	1950c	2182	2975	129	31x4 1/2	Case.....W	Cont.	6-3 1/2x4 1/2	27.34	Strom.	A-L.	A-K.	s-p	B&B.	Durston.	m Spicer.	3/2 F Tim.	4.75
1185	1235		1385d		1535		117	32x4	Chalmers.....1923	Own.	6-3 1/2x4 1/2	25.35	Strom.	A-L.	Remy.	m-d	Own.	Own.	m Hardy.	3/2 F Adams.	5.13
							122	32x4	Chalmers.....1923	Own.	6-3 1/2x4 1/2	25.35	Strom.	A-L.	Remy.	m-d	Own.	Own.	m Hardy.	3/2 F Adams.	5.13
1595	1485	1635	1785c		1785	2385	123	32x4	Chandler.....Six	Own.	6-3 1/2x5	29.40	Strom.	Bosch.	Bosch.	s-p	B&B.	Own.	f Own.	F Own.	4.45
	1685				2270	2995f															
510	525	425g		680	860		103	30x3 1/2	Chevrolet.....Superior	Own.	4-3 1/2x4	21.70	Zenith.	Remy.	Remy.	e	Own.	Own.	m Own.	3/2 F Own.	3.77
					850																
1085	995		1095d	1195	1295		112 1/2	31x4	Cleveland.....42	Own.	6-3 1/2x4 1/2	22.50	Strom.	Bosch.	Bosch.	s-p	B&B.	Own.	m Mech.	3/2 F Own.	4.90
			1260d	1195d	1595																
	2175	2175		2750c	3075	3075	127 1/2	33x5	Cole.....Master	Nort.	8-3 1/2x4 1/2	39.20	Johnson.	Delco.	Delco.	m-d	Norta.	North.	m Spicer.	F Col.	4.70
	1175			1925c	1995		115	32x4	Columbia.....Big Six	Cont.	6-3 1/2x4 1/2	27.34	Strom.	A-L.	A-K.	s-p	B&B.	Durston.	m Spicer.	3/2 F Tim.	4.75
985c	1135		1395d	1295	1465		115	31x4	Columbia.....Light Six	Cont.	6-3 1/2x4 1/2	23.44	Strom.	A-L.	A-L.	s-p	B&B.	Durston.	m Spicer.	3/2 F Tim.	5.10
	1095				1685																
1195	1235		1195b	1875f	2055		116	32x4	Courier.....	Falls.	6-3 1/2x4 1/2	23.44	Strom.	West.	A-K.	s-p	B&B.	Muncie.	f Flexite.	3/4 F Col.	5.10
			1565c		2055																
	3100	3170		3500c	4500	4500	133	33x4 1/2	Crawford.....23-6-70	Cont.	6-3 1/2x5 1/2	31.54	Zenith.	West.	Bosch.	m-d	B-L.	B-L.	m Spicer.	3/4 F Tim.	
					4500		138	33x5	Crawford-Dagmar.....6-70	Cont.	6-3 1/2x5 1/2	31.54	Zenith.	West.	Bosch.	m-d	B-L.	B-L.	m Spicer.	3/4 F Tim.	
	5890	6300			7650		112	33x5	Cunningham.....V4	Own.	8-3 1/2x5	45.00	Strom.	Delco.	Delco.	m-d	Own.	Own.	f Sneed.	F Tim.	4.21
5000	4650	4700	4650c		6350	6450	132	33x5	Daniels.....23-38	Own.	8-3 1/2x5 1/2	39.20	Zenith.	Delco.	Delco.	m-d	Own.	Own.	m Spicer.	F Tim.	4.23
		1807			5600																
	5030	5150		6030c	6600	6800	132	33x5	Daniels.....23-38	Own.	8-3 1/2x5 1/2	39.20	Zenith.	Delco.	Delco.	m-d	Own.	Own.	m Spicer.	F Tim.	4.23
	195		1495c		1595	1795	115	31x4	Davis.....71	Cont.	6-3 1/2x4 1/2	23.44	Strom.	Delco.	Delco.	s-p	B&B.	Warner.	m M&E.	3/2 F Tim.	5.10
1595	1595		1695d	2095	1795		120	32x4 1/2	Davis.....83	Cont.	6-3 1/2x4 1/2	23.44	Strom.	Delco.	Delco.	s-p	B&B.	Warner.	m Peters.	3/2 F Tim.	5.13
850	880			930	1440		111	32x4	Dodge Brothers.....	Own.	4-3 1/2x4 1/2	24.03	Stewart.	N.E.	N.E.	m-d	Own.	Own.	m Own.	3/2 F Own.	4.16
					1195																
	3950	3950	4150c	4985c	5550*	5800*	136	33x5	Dorris.....6-80	Own.	6-4 x5	38.40	Strom.	West.	Bosch.	m-d	Own.	Warner.	m Spicer.	3/2 F Tim.	4.23
	870	885		935c	1240	1350	108	31x4	Dort.....23-18	Lye.	4-3 1/2x5	19.60	Carter.	Bosch.	Conn.	m-d	Detlaff.	Own.	m Mech.	3/4 F Flint.	4.66
	1010	1025		1135c	1355	1465	115	31x4	Dort.....25-20	Falls.	6-3 1/2x4 1/2	23.44	Carter.	Bosch.	Conn.	m-d	Detlaff.	Own.	m Mech.	3/4 F Flint.	4.66
5750	5500	5900	5750c		7250	7500	131	33x5	Duesenberg.....Straight 8	Own.	8-2 1/2x5	26.45	Strom.	Delco.	Delco.	s-p	Own.	Own.	f Climax.	3/4 F Own.	4.43
890	890		1965d	1305	1365		109	31x4	Durant.....A-22	Cont.	4-3 1/2x4 1/2	24.03	Till.	A-L.	A-L.	s-p	Own.	Warner.	m Spicer.	3/2 F Adams.	4.33
					1465																
1000	1650			2250	2400		123 1/2	32x4 1/2	Durant.....B-22	Inst.	6-3 1/2x4 1/2	25.35	Rayfield.	A-L.	A-L.	s-p	Ansted.	Warner.	m Spicer.	3/2 F Tim.	5.13
1485	1095		1275d	1395c	1595		112	32x4	Earl.....40	Own.	4-3 1/2x5 1/2	18.01	Spoe.	A-L.	Conn.	s-p	B&B.	Own.	f Own.	3/2 F Own.	4.67
			1135		1425		112	31x4	Elcar.....4-40	Lye.	4-3 1/2x5	21.03	Strom.	Delco.	Delco.	s-p	B&B.	Warner.	m Peters.	3/2 F Salis.	4.50
1395	1395		1595d	1975	1995		118	32x4	Elcar.....6-60	Cont.	6-3 1/2x4 1/2	27.34	Strom.	Delco.	Delco.	m-d	Warner.	Warner.	m Spicer.	3/4 F Salis.	4.50
	1045			1145	1145		108 1/2	32x4	Essex.....	Own.	4-3 1/2x5	18.23	Own.	Bosch.	Bosch.	m-d	Own.	Own.	m Spicer.	3/4 F Own.	4.66
1195	1195		1195	1895c	1985		120	32x4 1/2	Flint.....	Cont.	6-3 1/2x5	27.34	Strom.	DeJon.	DeJon.	s-p	Own.	Warner.	m Spicer.	3/4 F Adams.	
260	299c	235g		530	595		100	30x3 1/2	Ford.....T	Own.	4-3 1/2x4	22.50	Own.	Own.	Own.	m-d	Own.	Own.	m Own.	3/2 F Own.	3.63
					725																
2975	2975			3975	3975		132	32x4 1/2	Fox.....Air-Cooled	Own.	6-3 1/2x5	27.34	Zenith.	West.	Scintilla.	m-d	B-L.	B-L.	m Spicer.	3/2 F Tim.	1.90
	1950			2750c	2250	\$2950d	115	32x4	Franklin.....10	Own.	6-3 1/2x4	25.35	Own.	A-K.	A-K.	s-p	B&B.	Own.	m Spicer.	3/2 F Tim.	1.73
				2850f	2850																
995	995		1145c	1145	1445		112														



Specifications

of Sport Sedan Model

Coachbuilt Anderson Aluminum Body; 6-cylinder Red Seal Continental Motor; Westinghouse Starting, Lighting and Ignition; Borg and Beck Clutch; Steel Disc Wheels with 5 Cord Tires and Tire Cover; Luggage Trunk on rear fitted with 2 Suit Cases; Bumpers and Snubbers, front and rear; German Silver Radiator Shell; Dome and Reading Lights; Vanity Case and Smoking Set; Heater; Sun Shade; Foot Dimmer for Headlights; Color—Gray, with black fenders and black upper body; Wheelbase—115 inches; Averages 19 miles per gallon of gasoline.

Ask about the Anderson direct-with-factory contract with maximum discount.

ANDERSON MOTOR COMPANY
Rock Hill, South Carolina

The
Sport Sedan
\$1795

Touring Car \$1195; Coach \$1495
Sport Touring \$1395; Sedan \$1695
f. o. b. factory

The Coachbuilt
ANDERSON
ALUMINUM SIX

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES							Wheel Base (Ins.)	Tire Size (Ins.)	NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM		Clutch: Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE		
OPEN MODELS			CLOSED MODELS							Make	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make				Ignition Make	Type and Make	Gear Ratio
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.														
\$2385	\$1885	\$2385	\$2385e	.....	3375	3075	124	32x4 1/2	Kissel.....45	Own.	6-3 1/2 x 5 1/2	26.38	Strom.	Remy.	Remy.	m-d Warner	Warner.	m Spicer	F Own.	3.92
5000	5000	5000	4200e	.....	6300	6500	132	33x5	LaFayette.....	Own.	8-3 1/2 x 5 1/2	33.80	Johnson.	Delco.	Delco.	m-d Own.	Own.	m Own.	F Own.	4.88
1795	1795	1795	2145d	.....	2345	2345	123	32x4 1/2	Lexington.....23	Anst.	6-3 1/2 x 4 1/2	25.35	Rayfield.	G-D.	Conn.	m-d Own.	Warner.	f Sneed.	F Salis.	5.10
1575	1395	1575	1575	.....	2085	2246	117	32x4	Liberty.....10-D	Own.	6-3 1/2 x 5	23.44	Strom.	Wagner	Wagner	s-p B&B.	Detroit.	m Spicer	1/2 F Tim.	4.80
3800	3800e	3800	4600e	.....	4400	4900	136	33x5	Lincoln.....	Own.	8-3 3/4 x 5	36.45	Strom.	Delco.	Delco.	m-d Own.	Own.	m Spicer	F Tim.	4.88
8900	9500e	9600	11750	.....	11750	11600	142	35x5	Locomobile.....Series 8	Own.	6-4 1/2 x 5 1/2	48.60	Ball&B.	West.	Delco.	m-d Own.	Own.	m Own.	F Own.	3.85
3385	3185	3185	.....	.....	4385	4385	136	32x4 1/2	Marmon.....34	Own.	6-3 3/4 x 5 1/2	33.75	Strom.	Delco.	Delco.	m-d Own.	Own.	m Spicer	1/2 F Own.	4.10
885	885	.....	975b	985	1235	1625d	100	31x4	Maxwell.....	Own.	4-3 3/4 x 4 1/2	21.03	Stewart.	Remy.	Remy.	c Own.	Own.	f Own.	1/2 F Own.	4.60
5400	5600	5700	6720	6720	6690e	6810	140	33x5	McFarlan.....1923	Own.	6-4 1/2 x 6	48.60	Rayfield.	West.	West.	m-d M&E.	B-L.	m Peters	F Tim.	3.75
3950b	3750e	3950e	3950e	3750e	4700	5000	132	32x4 1/2	Merced.....Series 5	Own.	4-3 3/4 x 6 1/2	22.50	Ball&B.	West.	Eisem.	m-d Own.	Own.	m Spicer	F Own.	3.87
1695	1695	.....	1495d	1585e	1695	1895	119	32x4	Merit.....6	Cont.	6-3 3/4 x 4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	Muncie.	f Sneed.	F Col.	4.62
1295	1295	.....	1495d	1585e	1695	1895	115	31x4	Moon.....6-40	Cont.	6-3 3/4 x 4 1/2	23.44	Strom.	Delco.	Delco.	s-p B&B.	Warner.	m Spicer	1/2 F Tim.	5.10
.....	.....	1785	1995e	.....	2585	2485	128	32x4 1/2	Moon.....6-58	Cont.	6-3 3/4 x 4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	B-L.	m Spicer	1/2 F Tim.	5.00
1240	1240	.....	1645e	.....	2090	2190	121	33x4	Nash.....691-3-6-7	Own.	6-3 1/2 x 5	25.35	Marvel.	Delco.	Delco.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.50
915	935	.....	1195d	.....	1445	1275	112	33x4	Nash.....692-4-5-8	Own.	4-3 3/4 x 5	18.23	Marvel.	Delco.	Delco.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.88
2175	2475e	2375	2485d	.....	3250	3285	130	32x4 1/2	Nash.....41-8	Own.	4-3 3/4 x 5	18.23	Marvel.	Delco.	Delco.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.88
2500	2500e	2600e	.....	.....	3500	.....	128	33x5	National.....BB	Own.	6-3 1/2 x 5 1/2	20.40	Rayfield.	West.	Delco.	s-p B&B.	B-L.	m Universal	F Col.	4.08
975	995	795g	1165e	1185	1515	.....	115	32x4	Nema.....4C	Cont.	6-3 3/4 x 4 1/2	27.34	Zenith.	Delco.	Delco.	s-p B&B.	Detroit.	m Spicer	1/2 F Tim.	4.45
975	975	.....	1145a	1195	1445	.....	115	32x4	Oakland.....6-44	Own.	6-2 1/2 x 4 1/2	18.99	Marvel.	Remy.	Remy.	c Own.	Muncie.	m Mech.	F Own.	4.70
1625p	1850	1735	1165e	1185	1515	2635	122	33x4 1/2	Oldsmobile.....43 A	Own.	4-3 1/2 x 5 1/2	21.86	Zenith.	Delco.	Delco.	s-p B&B.	Muncie.	m Own.	1/2 F Own.	4.70
525	525	.....	1675e	1875	2025	.....	115	32x4	Oldsmobile.....46	Own.	8-2 1/2 x 4 1/2	26.45	Ball&B.	Delco.	Delco.	c Own.	Muncie.	m Spicer	F Own.	4.63
750	750	.....	425g	795	860	.....	100	30x3 1/2	Oldsmobile.....47	Own.	8-2 1/2 x 4 1/2	26.45	Johnson.	Delco.	Delco.	s-p B&B.	Muncie.	m Own.	1/2 F Own.	5.10
2485	2485	.....	2650e	3175e	3275	3350d	126	33x4 1/2	Overland.....91	Own.	4-3 3/4 x 4	18.23	Till.	A-L.	A-L.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.50
3850	3650	.....	4550e	4725	4700e	136	33x5	33x5	Overland.....92	Own.	4-3 3/4 x 4	19.60	Till.	A-L.	A-L.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.50
2695	2450	2450	3850	4900f	4950f	143	33x5	33x5	Packard.....126	Own.	6-3 3/4 x 5	27.34	Own.	A-K.	Delco.	m-d Own.	Own.	m Spicer	1/2 F Own.	4.66
1550	1390	1425	1465d	2395d	2395	.....	120	32x4 1/2	Packard "Eight".....133	Own.	6-3 3/4 x 5	27.34	Own.	A-K.	Delco.	m-d Own.	Own.	m Spicer	1/2 F Own.	4.66
3300	2990	2990	3300	3400	4090	.....	128	33x5	Packard "Eight".....136	Own.	6-3 3/4 x 5	36.45	Own.	Dyneto.	Delco.	m-d Own.	Own.	m Spicer	1/2 F Own.	4.70
5250	5250	5250	6800	6900	6800	138	33x5	33x5	Packard "Eight".....143	Own.	6-3 3/4 x 5	36.45	Own.	Dyneto.	Delco.	m-d Own.	Own.	m Spicer	1/2 F Own.	4.70
.....	1695	1745	1745	2445	2495	.....	126	32x4 1/2	Paige.....6-70	Own.	6-3 3/4 x 5	33.75	Rayfield.	Remy.	A-K.	m-d Long.	Warner.	m Mech.	1/2 F Tim.	4.60
2535	2535	2585d	2635d	.....	3385	3585	126	32x4 1/2	Paterson.....23-6-52	Cont.	6-3 3/4 x 4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	Durston.	m Hartford	1/2 F Salis.	4.50
1095	1095	.....	1750	1825	.....	117	32x4	32x4	Peerless.....23	Own.	8-3 1/2 x 5	33.80	Ball&B.	Delco.	Delco.	m-d Own.	Own.	m Spicer	1/2 F Tim.	1.90
.....	1665	2850	2850e	2385e	2475	.....	116	32x4	Pierce-Arrow.....	Own.	6-4 x 5 1/2	38.40	Own.	Delco.	Delco.	m-d Own.	Own.	m Spicer	1/2 F Own.	4.29
.....	2535	2585d	2635d	.....	3385	3585	126	32x4 1/2	Pilot.....6-50	H-S.	6-3 1/2 x 5	25.35	Till.	Wagner	Wagner	s-p Hoosier	Muncie.	m Blood.	1/2 F Col.	4.67
1095	1095	.....	1750	1825	.....	117	32x4	32x4	Premier.....6-D	Own.	6-3 3/4 x 5 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	Own.	m Spicer	1/2 F Col.	4.88
.....	1665	2850	2850e	2385e	2475	.....	116	32x4	Premcar.....6-40-A	Falls.	6-3 3/4 x 4 1/2	23.44	Strom.	Wagner	Wagner	s-p B&B.	Mech.	m Spicer	1/2 F Tim.	5.00
3200e	3200	.....	3200e	.....	4000	.....	131	32x4 1/2	R & V Knight.....R	Own.	4-3 3/4 x 5	22.50	Strom.	Wag.	Wag.	s-p B&B.	B-L.	m Spicer	F Salis.	4.75
2685	2485	2685	2750e	3285	3585	4000f	128	32x4 1/2	R & V Knight.....H	Own.	6-3 1/2 x 5	24.34	Strom.	A-L.	A-L.	s-p B-L.	B-L.	m Spicer	1/2 F Tim.	5.40
3685	3485	3800	3650e	.....	4250p	3950	138	32x4 1/2	Reo.....76	Own.	6-3 1/2 x 5	24.34	Rayfield.	N.E.	N.E.	m-d Own.	Own.	m Spicer	1/2 F Tim.	4.70
10900	10900	10950	.....	.....	12800	12850	143 1/2	33x5	Revere.....M	Dues.	6-4 1/2 x 6	30.63	Strom.	West.	Bosch.	m-d B-L	B-L.	m Spicer	1/2 F Stand.	3.44
.....	1615	1615	2615d	2615	.....	118	33x4	33x4	Rickenbacker.....B	Own.	6-3 1/2 x 4 1/2	23.44	Strom.	Bosch.	Bosch.	s-p Own	Own.	m Mech.	1/2 F Col.	4.63
.....	975	975	.....	.....	1885e	1985d	117	32x4	Roamer.....6-54-E	Cont.	6-3 3/4 x 5 1/2	29.40	Strom.	West.	Split.	s-p B&B.	G-L.	f Sneed.	1/2 F Tim.	4.60
.....	2500	2500e	.....	.....	3300	3400	127	34x4 1/2	Roamer.....6-54-E	Cont.	6-3 3/4 x 5 1/2	29.40	Strom.	West.	Split.	s-p B&B.	G-L.	f Sneed.	1/2 F Tim.	4.60
2750	2750	2750	2425g	.....	3585	3985	130	32x4 1/2	Rolls-Royce.....40-50	Own.	6-4 1/2 x 4 1/2	48.60	Own.	Bijur.	Bosch.	c Own.	Own.	m Own.	F Own.	3.25
319r	318r	285g	.....	.....	4250p	3950	138	32x4 1/2	Rubay.....	Own.	4-2 1/2 x 5 1/2	12.10	Strom.	Bosch.	Bosch.	s-p Own	Own.	m Universal	F Own.	5.10
2250	2250	2450	2275e	.....	3500	3450	125	34x4 1/2	Sayers Six.....DP	Cont.	6-3 3/4 x 4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	G-J.	m Arvac	1/2 F Eaton	4.75
2700	2700	2850	2700e	3350e	3500	4500e	130	34x4 1/2	Seneca.....L-2 & O-2	Lye.	4-3 1/2 x 5	19.60	Zenith.	A-L.	A-L.	s-p B&B.	G-L.	m Universal	F Peru.	4.75
1445	1395	1745	1695d	1995	.....	2385	124	33x4 1/2	Seneca.....50c & 51c	Lye.	4-3 3/4 x 5	21.03	Zenith.	A-L.	A-L.	s-p B&B.	G-L.	m Universal	F Peru.	4.75
975	995	785g	.....	.....	1885e	1985d	117	32x4	Standard.....99	Own.	8-3 1/2 x 5	33.80	Zenith.	West.	Split.	s-p B&B.	G-L.	m Arvac	1/2 F Tim.	4.45
1325	1350	1750	1000e	1975d	2050	.....	119	32x4	Stanley.....740	Own.	2-4 x 5	.....	None.	Bijur.	None.	None.	None.	None.	1/2 F Own.	1.50
1450g	1750	1750	1000e	1975d	2050	.....	119	32x4	Star.....	Cont.	4-3 1/2 x 4 1/2	15.63	Till.	A-L.	A-L.	s-p Own	Warner.	m Spicer	1/2 F Tim.	4.87
1995	1995	2314d	.....	.....	3500	4500e	130	34x4 1/2	Stearns-Knight.....SKL4	Own.	4-3 3/4 x 5 1/2	22.50	Rayfield.	West.	A-K.	m-d Own	Own.	f Climax	1/2 F Own.	4.60
2450	2790	2640	2765a	.....	3490	.....	130	32x4 1/2	Stearns-Knight.....6	Own.	6-3 3/4 x 5	2								



Why is the head
of a **TOLEDO VALVE**
Electrically
WELDED?

THE BOND IS VITAL

The amalgamation of the different metals composing the head and the stem is the most important and difficult problem in valve manufacture. Most valve failures result from an imperfect bond.

The electric welding process used by this company exclusively is the only method that will produce the absolutely perfect bond between the special process head and carbon steel stem of a Toledo Standardized Valve.

Toledo Standardized Valves are welded entirely through the head. The bond is perfect all the way through. No amount of use or abuse in service will separate the head from the stem of a Toledo Standardized Valve.

Toledo Valves are neatly boxed. Every valve is wrapped in strong kraft. The serial number is stamped on the head. All leading jobbers have stocks. Ask 'em to buy 'em by the set.

Service Stations: Ask your jobber about our "Service Station Stock Plan." It is one of the most profitable propositions ever offered.



Toledo Steel Products Company
Toledo, Ohio



Ask 'Em to Buy 'Em By the Set

TOLEDO

Standardized

VALVES

Valves Exclusively for over 9 Years

Many of the leading car manufacturers specify these caps as standard on their tire equipment. Look for Instant-ons on the valve stems of the car you buy.



This Ends Valve Cap Annoyance

WITH Instant-ons on your valve stems you never waste a moment when there is need to change or inflate tires.

These caps combine valve cap and dust cap in one convenient unit which goes on or off in a few seconds.

What motorist has not suffered annoyance from old fashioned multi-threaded dust caps? That annoyance is ended—most cars are now equipped with Instant-ons.

Live dealers are cashing in with the attractive Instant-on display carton. Order from your jobber.

Retails at one dollar for a box of five.

THE DILL MANUFACTURING CO., Cleveland, O.
Manufactured in Canada by The Dill Manufacturing Co., of Canada Ltd., Toronto
Also Manufacturers of Dill Standard Tire Valves and Dill Valve Insides

DILL

Tire Valves and Valve Parts

The New Handy Can

Put Up in Following Sizes: List Prices.

4 oz. size.....50c
(two grades)

1 lb. size.....\$1.50
(one grade only) put up in Friction Top Round Can.



Used by the automobile trade since 1907.



Will not upset. The hinged cover cannot be lost or mislaid and keeps out dirt. More coarse than fine in proportion to popular use. Two-thirds coarse, one-third fine.



The handy can does away with the old slab which is messy, collects dirt, iron filings and always thrown away as waste.



Packed in cartons of 12—it is an up and going article. A display box in colors that makes a sale.

ALL automobile mechanics and most owners understand the necessity of grinding in valves from time to time to insure perfect engine performance, also to eliminate waste of fuel and loss of power.

Monarch Valve Grinding Compound during the past years of service rendered has established its popularity with the professional mechanic together with the owner who makes his own minor repairs.

The sterling quality of Monarch compound remains the same (genuine Carborundum used as base for abrasive). We could not improve the compound but experience in manufacturing and shop practice has led to the development of the new box. We know this new handy box will be welcomed by both dealer and user. It has a distinct advantage from the standpoint of sales and working convenience alike. Manufactured by Producers Outlet Corp., Broad St., National Bank Bldg., Red Bank, N. J.



New York Office, 90 West Broadway, Mr. E. A. Judge
San Francisco Office, Sheldon Bldg. (Market at First St.) The
Maydwell Co.
Seattle Office, 95 Connecticut St., The Maydwell Co.



New Departure Ball Bearings

"The racing track has had a great part in the evolution of the present day automobile Many lessons will, undoubtedly, be learned and go directly into the manufacture of passenger cars."

It is an impressive fact that every American car which finished at Indianapolis this year was completely equipped with *ball bearings* — practically *all* of them with New Departures.

The demand of racing drivers each year for ball bearings throughout is reflected in the ever-growing interest of designers in "full-jeweled" chasses for passenger car use.

—ball bearings to replace types which not only use more power but by very principles of design wear to such an extent that the looseness which results must be taken-up approximately every 5,000 miles or sooner.

New Departure ball bearings do not wear appreciably during the life of the car and, hence, perform *without* adjustment and *without* consequent relaxation of the correct setting of gears and location of the rotating shafts they support.

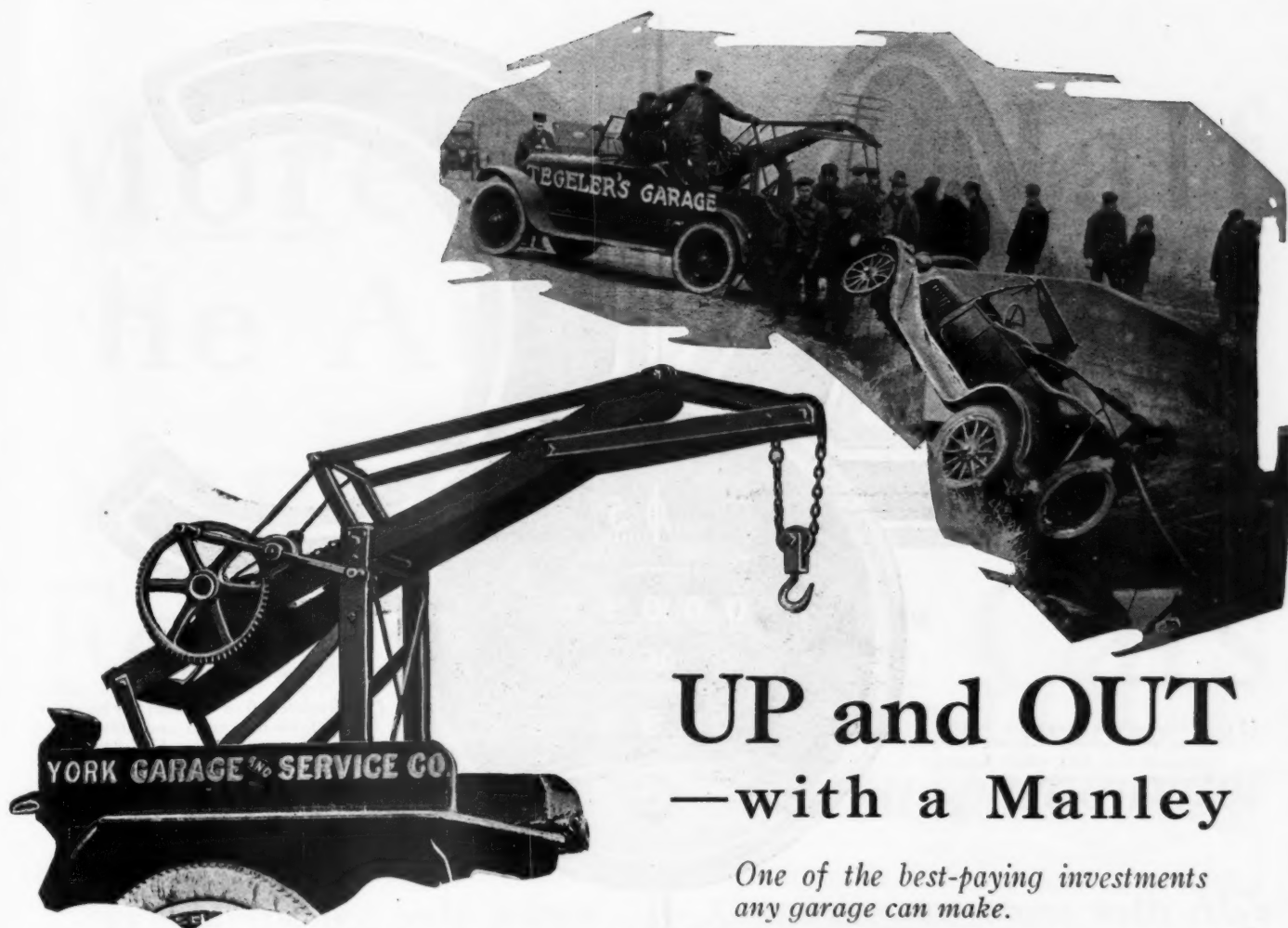
THE NEW DEPARTURE MANUFACTURING CO.
Bristol, Conn.

Detroit

Chicago

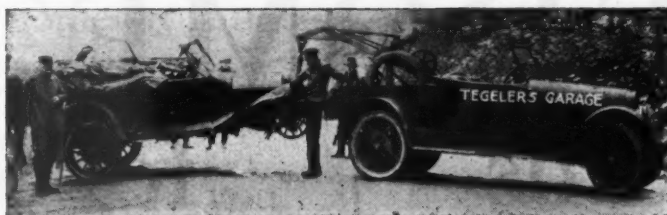
(The above quotation is from a statement by one of the foremost engineers in the automotive industry.)





UP and OUT —with a Manley

*One of the best-paying investments
any garage can make.*



IF a wreck is worth bringing in, the MANLEY will bring it in. Ask any Manley user—there are thousands of them.

Manley Wrecking Cranes pay for themselves in a few weeks—they bring in REAL repair-jobs, they advertise your garage as a live repair shop, they frequently sell NEW CARS to the disgusted owner of the wreck.

The Manley is no makeshift—every little detail WORKS—everything there is for a definite purpose. For instance—the Crane mounts on any chassis without the expense of special forgings, etc. Just bolts on. Comes off in three minutes, when it can be used for other purposes. Two cranes in one.

The Crane Beam tilts at any angle—another reason

for MANLEY ability to pull any wreck out of a hole. FOUR different leverages—if one can't budge it, another is sure to.

All structural steel members, riveted and bolted together into a unit that can make any wrecking job a mere matter of going out and bringing it back a good, fat repair-job.

"The Manley Wrecking Crane pays better than any other equipment a man can put in his garage," says a letter from Tegeler's Garage which furnished the wreck pictures on this page.

Manley Cranes come in three sizes. Special bulletin—and right now, special prices—on these and other Garage Equipment. Write.

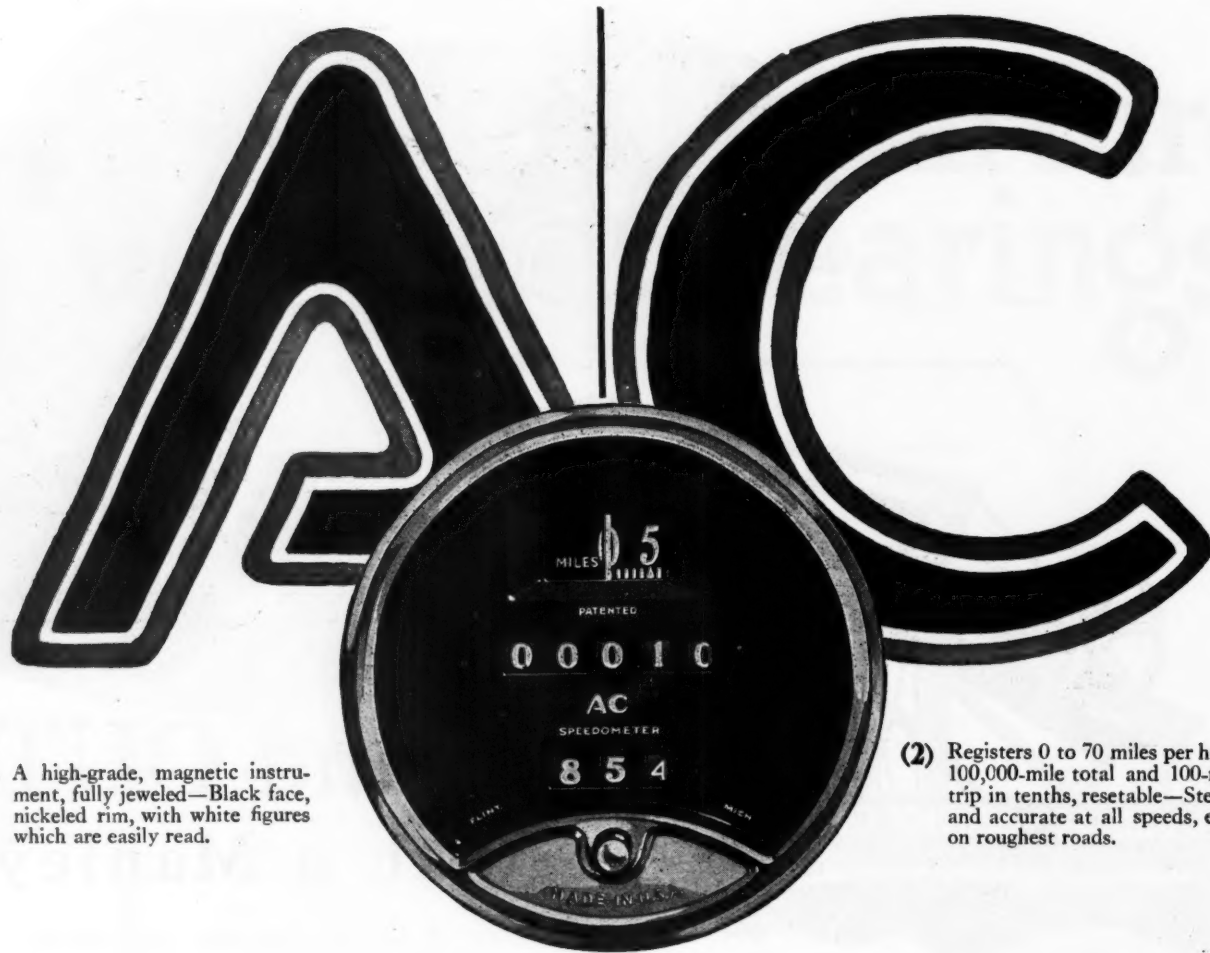
MANLEY MFG. CO., YORK, PENNA.

Manley

Garage Equipment

MADE IN YORK PA.





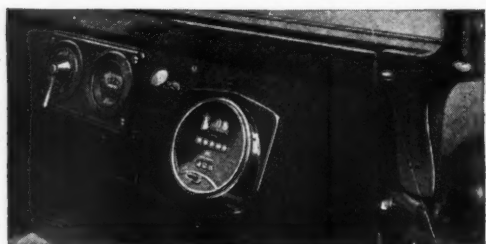
- (1) A high-grade, magnetic instrument, fully jeweled—Black face, nicked rim, with white figures which are easily read.

- (2) Registers 0 to 70 miles per hour, 100,000-mile total and 100-mile trip in tenths, resetable—Steady and accurate at all speeds, even on roughest roads.

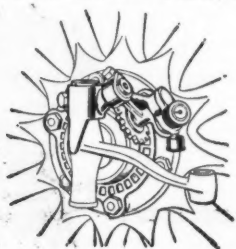
SPEEDOMETER

for Fords

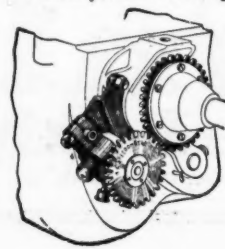
for Stars



- (3) Complete with all attachments for quick and easy installation. No special tools required—when installed it presents an attractive appearance and does not look like an afterthought.
- (4) Driving attachment has many features—there is no swivel joint to require attention, no holes to drill and the installation is easily and quickly made.



- (5) Can be mounted on instrument board—as shown—or below spark and throttle levers, as complete brackets and all attachments for quick and easy installation in either position are furnished with instrument.
- (6) Driving gear is attached to the drive shaft ahead of the universal joint—can be mounted without removing the universal joint or other parts.



- (7) Service on AC Speedometers is rendered through the nationally located branches of the United Motors Service, Inc.

More Than Half the Automobiles Manufactured Are Ford and Star Cars

—all being turned out without a speedometer

Every motorist not only wants but needs a speedometer. The desire to buy exists—it is simply up to you to complete the sale.

This opportunity affords you one of the biggest fields for immediate and continued profit in the accessory field.

Connect your store with AC's national advertising on AC Speedometers by prominently displaying the AC Speedometer poster on your window, the attractive display stand on your counter, and by making use of the other sales helps offered.

Quoted from PRINTER'S INK:

There must be good team-work between advertising and selling. Advertising leads prospects to the water but it cannot always make them drink—it takes a certain amount of sales effort on the part of the dealer to do that.

The maximum cannot be obtained from advertising except when the retailer follows up the interest that it creates.

AC Spark Plug Company

FLINT, Michigan

Makers of AC Spark Plugs—AC Speedometers



BEARINGS

for every application

GILLIAM Tapered Roller Bearings for wheels, differentials, pinion shafts transmissions and all other applications carried in stock at each of our 37 Branches. This is but one of the lines carried at our branches to give you PROMPT SERVICE.

BRANCHES

In thirty-seven cities!

AHLBERG BEARING COMPANY

321 East 29th St. Chicago

An Old Business with a New Name



Alemite
Reservoir Fitting

It made \$4,000 for one dealer
in a town of 2000 people

Twenty years ago a few companies made and sold a few thousand music boxes each year. The business was very small.

Then some scientific men took hold of it. Their inventive genius turned the music box into a phonograph—you know the rest.

Today a similar change is taking place in the garage and repair shop business. We will give you proof from a hundred cities if you care to write us.

Five years ago *greasing* was the handyman's job. It didn't pay to think about. Today — *Lubrication* is the biggest money-maker in the repair business.

One merchant in a town of 2000 made \$4,000 last year lubricating cars with Alemite. This is just one in hundreds who have done equally as well.

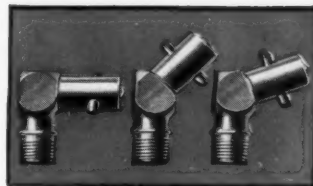
This is because the American motorist has been educated to the value of proper lubrication. More than half of all cars (Fords excepted) are Alemite-equipped. This means that some 3,000,000 motorists are out of the music box stage.

And these motorists will spend upwards of \$54,000,000 this year for scientific lubrication. Apply this to your own community.

Over half the cars in your city (Fords excepted) are Alemite-equipped. These cars must be lubricated every 500 miles. How much of the \$54,000,000 will be spent in your community?

If you're in the garage, repair or filling station business and are not equipped for complete Alemite lubricating service you're losing your share of the most profitable end of the business.

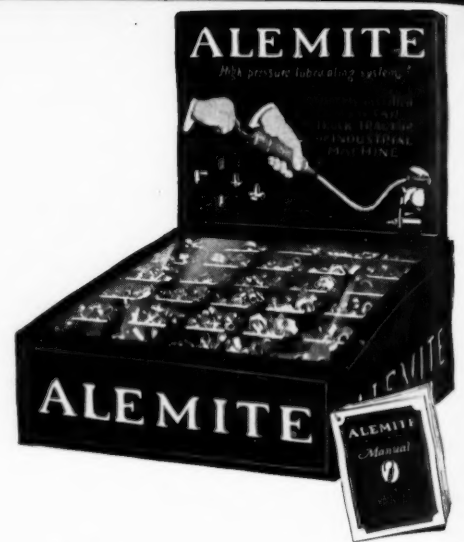
And it's an easy matter to get it. We can show you how. Just turn the page.



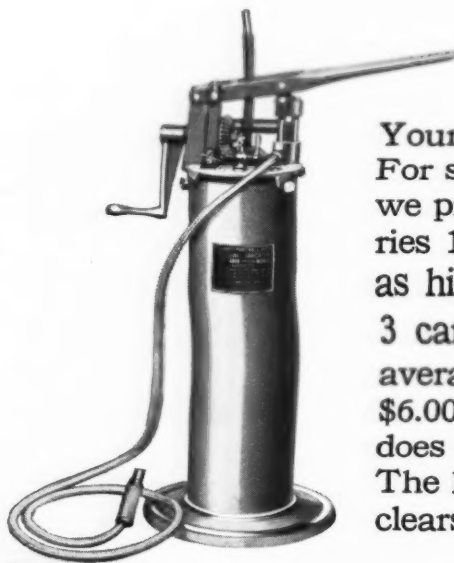
Alemite Fittings

It's an easy matter to get ALEMITE profits

Here you have the Alemite Counter Cabinet and Manual. This silent salesman has increased some dealers' business as much as 400%. *It holds down the quantity of stock you have to carry* and yet enables you to supply instantly a complete Alemite system for any make or model of car. The Manual specifies the kind and number of fittings for any installation.



For quick— efficient lubricating service



Your lubricating service is your big profit-maker. For speed, convenience and professional efficiency we provide the "H-15" portable compressor. It carries 15 pounds of lubricant and provides pressure as high as 2000 pounds. One man can lubricate 3 cars in an hour with this compressor. At an average of \$2.00 per car he can earn as high as \$6.00 per hour. It is easy to move around. And it does the work much faster than the hand model. The high pressure of one ton per square inch easily clears out clogged bearings.



As many as 100 cars per week can be lubricated on one of these racks. The investment is small, the returns are large.

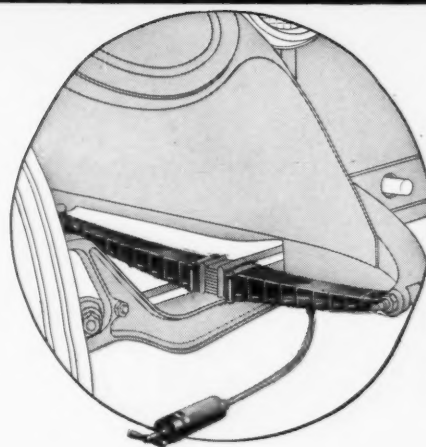
A L E M

Alemite Lubricating Spring Covers

It is a known fact that the first tires on a new car outwear all later ones. The reason is that while the car is new and the springs lubricated and in good condition they absorb the shocks that later on kill tires.

Alemite Lubricating Spring Covers keep the original life and flexibility in springs. For they exclude water and grit. They lubricate the leaves continuously.

In six months one dealer sold 700 sets of Alemite Lubricating Spring Covers at a profit of \$7,000.



Every motorist knows ALEMITE

Pushing these Alemite products for you is our tremendous national advertising campaign. As a dealer you also receive a local sales plan and advertising that gets results. It means extra business and new dollars in your cash register. One man in a town of 2000 made \$4,000 last year. What can you do this year?

Every month this year more than 7,000,000 Alemite sales messages are going out to the motorists of the country. Through The Saturday Evening Post, The Country Gentleman, Motor and other national publications we are reaching them all—not once but many times. The motorists in your community are reading these advertisements.



Alemite lubricant is recommended for use with the Alemite system. It is a pure solidified oil, not affected by temperature. For consumer use it is put up in convenient 5-lb., 1-lb. and 1/2-lb. containers from which the hand compressor can be filled without soiling hands or exposing the lubricant to dust or grit. For service stations lubricant is provided in drums of 100 lbs., 200 lbs. and 400 lbs.



ITE

*High pressure
lubricating system*

So far this year our sales have TRIPLED

So far this year our sales have *tripled* over the sales for any equal period in 1922. This means, *our dealers'* sales are tripling too.

The *science of lubrication* is here. Join this organization and grow with it. Start this month.

The sooner you are established with Alemite service, the sooner you'll get your full share of the business boom Alemite dealers are getting everywhere. Mail the coupon. Get full particulars and figure out the possibilities for yourself.

THE BASSICK MANUFACTURING CO.
2662 North Crawford Ave. Chicago, Illinois

ALEMITE

THE BASSICK MFG. CO.
2662 N. Crawford Ave., Chicago, Ill.
Gentlemen: Please send us without delay full particulars on the Alemite Dealer proposition and sales plan.

Name

Address

High Pressure
Lubricating System

Alemite can give you extra profits of \$100 to \$500 per month. This is easily worth investigation.



Gill Pins



A Ring To Meet Every Requirement

These three rings cover the entire field of piston ring demand. Individually cast out of round from the finest grey iron, lathe turned and machined to absolute accuracy.

Embody the same manufacturing principles as GILL Piston Rings— Quality and Accuracy

The Gill policy of quality, accuracy and service is well known throughout the automotive trade and industry. This same policy applies to GILL Piston Pins. In adding this new replacement part to the famous line of GILL Piston Rings we do so knowing that dealers, service stations and repair shops will quickly recognize the fact that GILL Piston Pins are quality products.

These pins are made from solid bar stock and conform strictly to engine manufacturers' design and steel specifications. Three separate heat treatments are used which produce a scleroscopic hardness of 70 to 90 degrees. Grinding limits are two-tenths of one one-thousandth of an inch (.0002) for taper and roundness, and one-half of one one-thousandth (.0005) for size. Each pin must pass a rigid gauge inspection. Jobbers and dealers in all sections of the country as well as thirty-one GILL branches in principal cities carry complete stocks for all makes of engines. Prompt deliveries are assured.

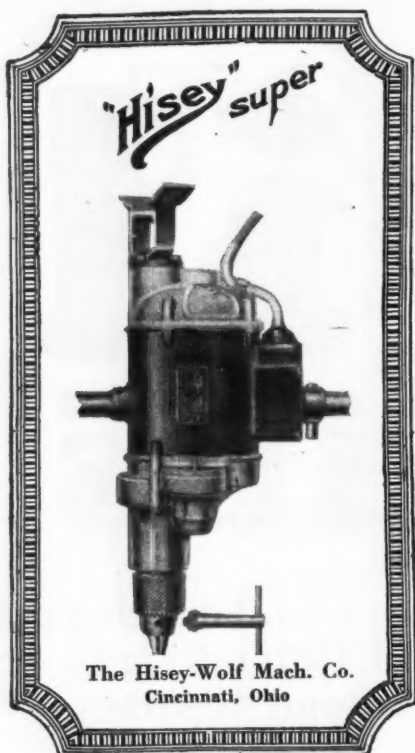
Write for a complete price list and specification book.

GILL MANUFACTURING COMPANY

8300 South Chicago Ave., Chicago



Good Work at a Good Profit



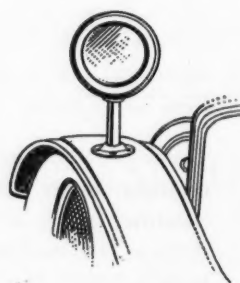
Your jobber has the Jacobs Chuck you need—for any purpose.

(CATALOGED)
in the Red Directory

Men who own cars today know more about them than they used to. And they know more about what service should cost.

So it is hard to put over an excessive charge—to cover the extra hours of labor that proper equipment would have saved.

Good equipment alone makes possible good work at a moderate charge—and at a good profit.



Mirror Installation

A clean hole in the fender is but a matter of seconds with a portable electric drill. Any other job, where neatness, accuracy and speed are wanted, is best done by this versatile tool. And you have a limitless source of energy in your lighting circuit.

THE JACOBS MFG. COMPANY, HARTFORD, CONN.

This advertisement inserted in the interest of better Service Equipment in general and "the use of Portable Electric Drills in particular"

"Speed Up Service With Machine Tools"



Has The MONOGRAM Service Inspector Called Yet?

He has nothing to sell. He has much to give. His job is to make selling easier for you. If there is anything you want to know, or need done, that will make Monogram Self-Locking Radiator Caps move faster or pay better, he will tell you about it or do it for you.

He is an experienced retail salesman, a crafty window trimmer, a past master at arranging stock to get attention. He knows the best ways to use the Monogram Sellengine and pedestal, those two sales-aids which have done so much to increase turnover and profits.

There is a Monogram Service inspector in your city or state, and he will soon have several companions. You need never be far from expert sales-assistance of genuine money-making value.

Use him—that's what he's for

GENERAL AUTOMOTIVE CORPORATION
600 West Jackson Boulevard
Chicago, Illinois

Idaho
Washington
Oregon



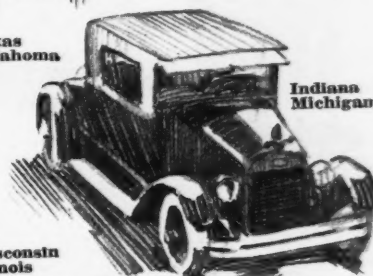
California
Nevada
Arizona

Kansas
Colorado
New Mexico



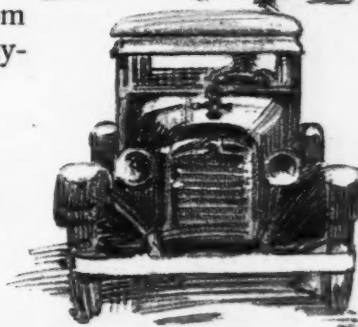
Iowa
Nebraska
The Dakotas

Texas
Oklahoma



Indiana
Michigan

Wisconsin
Illinois



Ohio
West Virginia

Pennsylvania

New York
New Jersey
Connecticut

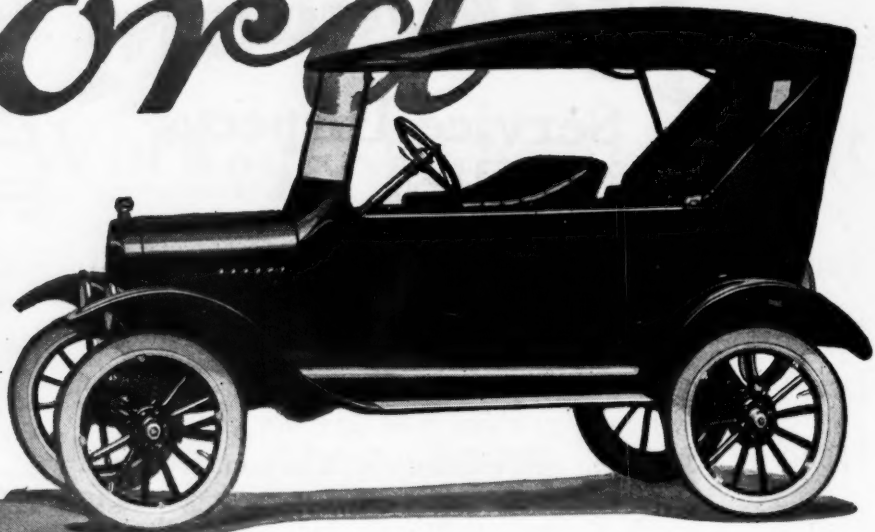
New England



Welcome him when
he calls



Ford

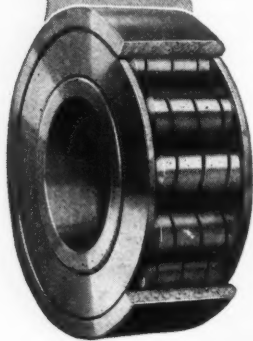


ALL over the world millions of Ford cars have consistently demonstrated the strength and economy of The Universal Car.

Through all kinds of weather, over all kinds of roads, Ford owners have found their cars capably and dependably standing up under the severest service conditions.

Hyatt roller bearings are used in the rear axle—in the hubs, in the differential and on the pinion shaft—and are an important factor in its construction.

They insure a simple, rugged, trouble-proof, rear axle.



HYATT ROLLER BEARING COMPANY

Newark Detroit Chicago San Francisco

Worcester Milwaukee Huntington, W. Va. Minneapolis Philadelphia
Cleveland Pittsburgh Buffalo Indianapolis

HYATT

Quiet

Roller Bearings

AMERICAN *Springs*

are always
UNIFORM

Scientifically determined heat treatment, mechanically controlled, guarantees absolutely uniform results. Every spring leaf is machine formed—not hammered to fit—and oil tempered while still in the forming die. Even the drawing of the temper is mechanically controlled.

Every American Spring is inspected after each operation and each completed spring is tested under load conditions.

You can depend on American Springs.

AMERICAN AUTOPARTS COMPANY

9775 French Road

Detroit, Mich.



Sell the Tire Lock That Stays Sold!



Approved by
the
Underwriters'
Laboratories,
Inc.

With a Worth-While Profit on Every Sale

In supplying the rapidly increasing demand for a lock to prevent spare tire thefts sell more than a "promise" of protection. Sell the lock that *holds*, that *stays sold*, and wins for you the gratitude of your customers by *stopping* the theft of their spare tires.

The Johnson Spare Tire Lock is the outstanding achievement among all attempts to provide car owners with a *dependable* spare tire lock.

More have been sold than of any other tire lock on the market. A strong National Advertising Campaign in the Sat-

urday Evening Post is already back of you. And there's a real worth-while profit on every sale.

It is built of heavy aircraft cable, armored with hardened steel beads that revolve from under every blow. Made in all lengths, it fits any car or tire. The lock itself, a specially hardened steel block, locks against the shoulder of any bead. Unlocks only with the owner's key.

Supply the profitable demand for this *real* spare tire lock. Order from your jobber's salesman, or write us direct at once.

Address Department B

JOHNSON AUTOMOBILE LOCK COMPANY, ST. LOUIS, U. S. A.

Makers of the famous Johnson Transmission Lock

Johnson

SPARE TIRE LOCK

A Dependable Partner



—goes a long way
to make friends

It is not an exaggeration to say that the class of dealers who sell the General Cord are the kind of merchants who select a tire as carefully as they would a partner.

If you were going into business with a man, what qualities would appeal to you? First—you would want him to have a record of success—and there's no question but what the General Cord has that. Secondly—you would want an honest partner. Think back in tire history. Have you ever heard of the General Cord in any sort of questionable deal? Have you ever seen it offered at cut prices? Have you ever heard of any disagreements between this factory and its dealers?

Lastly—You would want a partner

who wouldn't prove a "quitter." When times are good, a "fair-weather" tire is all right—but when business is generally bad—as it was in 1921—a tire like the General Cord, that can increase its sales in spite of the country-wide depression, has proved that it isn't a "quitter."

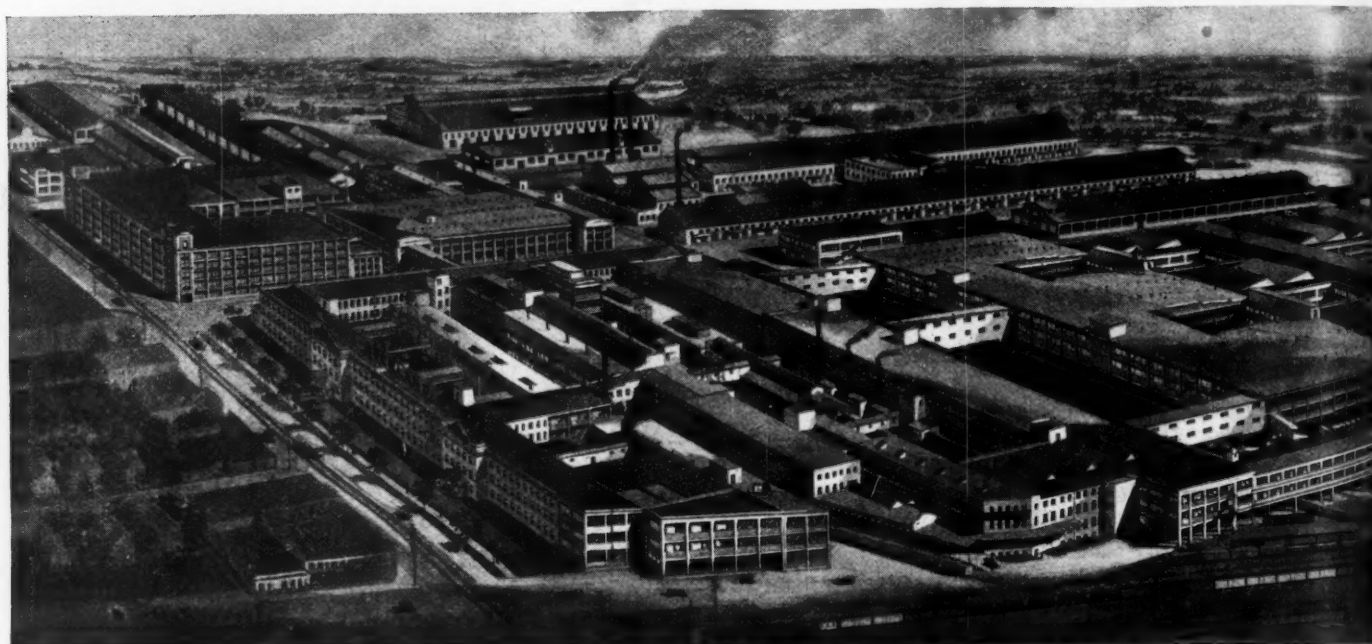
The few simple policies on which the General factory was started may not have been sensational—but they were sound—and have been steadily maintained without change. The men at the head of the General's factory were tire dealers themselves. They know what it takes to make a dependable partner for a dealer. Write for our Class "A" dealer's proposition, and learn how such a profitable partnership may be formed.

THE GENERAL CORD TIRE



THE GENERAL TIRE AND RUBBER COMPANY
AKRON, OHIO, U. S. A.

Into the SECOND



The great Willys-Overland shops are now far into the production of the second million Overlands and Willys-Knights.

Every man jack is on his toes and every machine is geared up in response to the always mounting demand for more cars.

More midnight oil than ever is being burned in the ceaseless effort to provide even greater values—values which are already the talk of the industry and the greatest in all Willys-Overland history.

New plans are in the making.

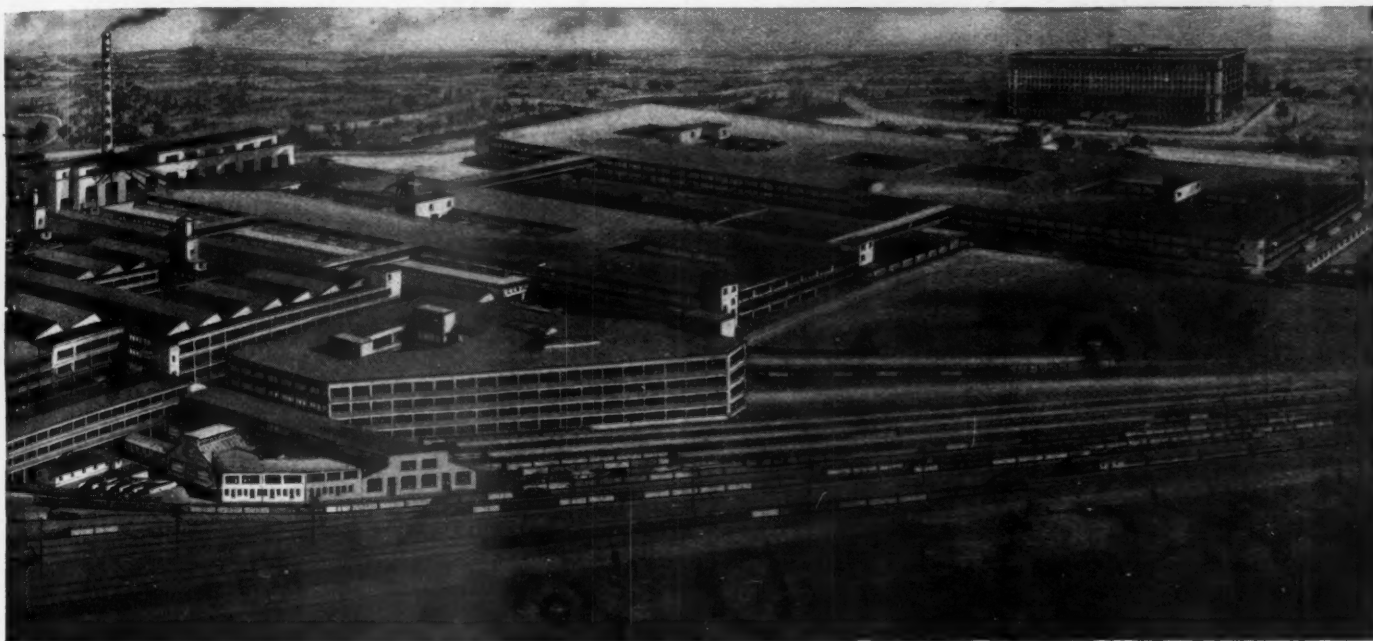
And everywhere, Willys-Overland merchants are prospering as never before—prospering on a basis of permanent integrity which insures even greater future prosperity.

The year 1923 is setting a new high mark for values given, for volume

Overland Models: Touring \$525, Sedan \$860, Roadster \$525, Coupe \$795, Red Bird \$750. Willys-Knight Models: 5-pass. Touring \$1235, 3-pass. Roadster \$1235, 7-pass. Touring \$1435, 5-pass. Country Club \$1635, 5-pass. Coupe-Sedan \$1595, 5-pass. Sedan \$1795, 7-pass. Sedan \$1995, all prices f. o. b. Toledo. We reserve the right to change prices and specifications without notice.

W I L L Y S -

MILLION



of sales made and for merchants' profits. And we are going forward. In range of price and models, the Willys-Overland line answers the requirements of 90% of the automobile purchasers—\$525 to \$1995, in open and closed cars of every type.

The Overland merchant has the outstanding advantage of one franchise, one factory policy and one powerful advertising campaign back of a complete line of automobiles.

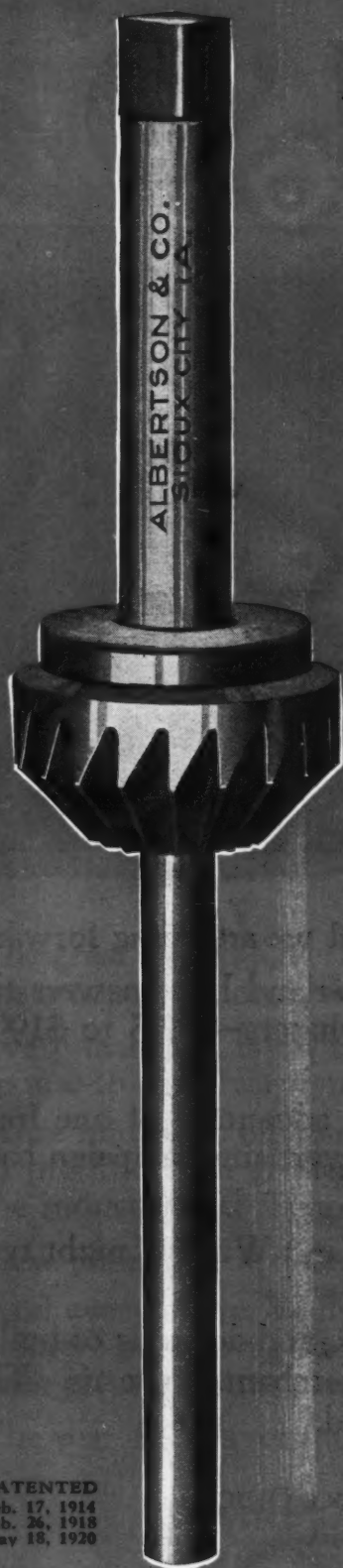
Compared with other values, each Overland and Willys-Knight type excels. The super worth is there.

If you are a good business man, ready to work, and desirous of building a first-class business as an automobile merchant, write us. The Willys-Overland present and future are sound.

WILLYS-OVERLAND, INC., TOLEDO, OHIO
Willys-Overland Ltd., Toronto, Ontario

OVERLAND

SIoux VALVE SEAT REAMER



PATENTED
Feb. 17, 1914
Feb. 26, 1918
May 18, 1920

Does Your Shop Toe the Mark?

UNLESS it is equipped with tools that insure efficiency, accuracy and speed you cannot expect it to increase your profits and reduce your overhead.

"Sioux" Tools mean more and better work at smaller cost.

You can save hours of tiresome valve grinding by removing the carbon pits and other irregularities from valve seats with this rapid cutting and absolutely accurate Sioux Reamer. There's a Sioux Valve Seat Reamer for every engine made.

No Chattering of valve seat. By inserting a piece of 50 lb. wrapping paper, large enough to cover valve seat, on the pilot stem between reamer and valve seat you avoid all possibility of chattering. A few turns will cut through paper. Write for free sample.

Your Jobber Sells Them

Write for Catalog and Valve Seat Reamer Specifications
ALBERTSON & CO., SIoux CITY, IOWA

*"The Well Equipped Shop
Gets the Business"*



TUNG-SOL

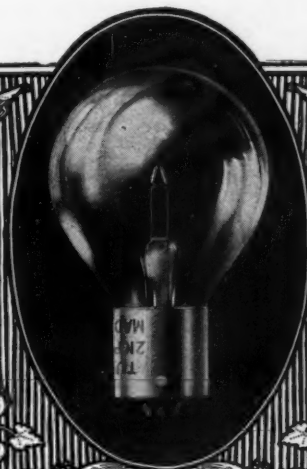
LONG life and standardized efficiency are two prominent features of TUNG-SOL. The dealer who sells, and the owner who uses TUNG-SOL know that every lamp is the counterpart of the other. The Quality of each TUNG-SOL is safeguarded and maintained by constant tests and inspections through every process of construction. The Quality of TUNG-SOL never varies.

MINIATURE INCANDESCENT LAMP CORPORATION

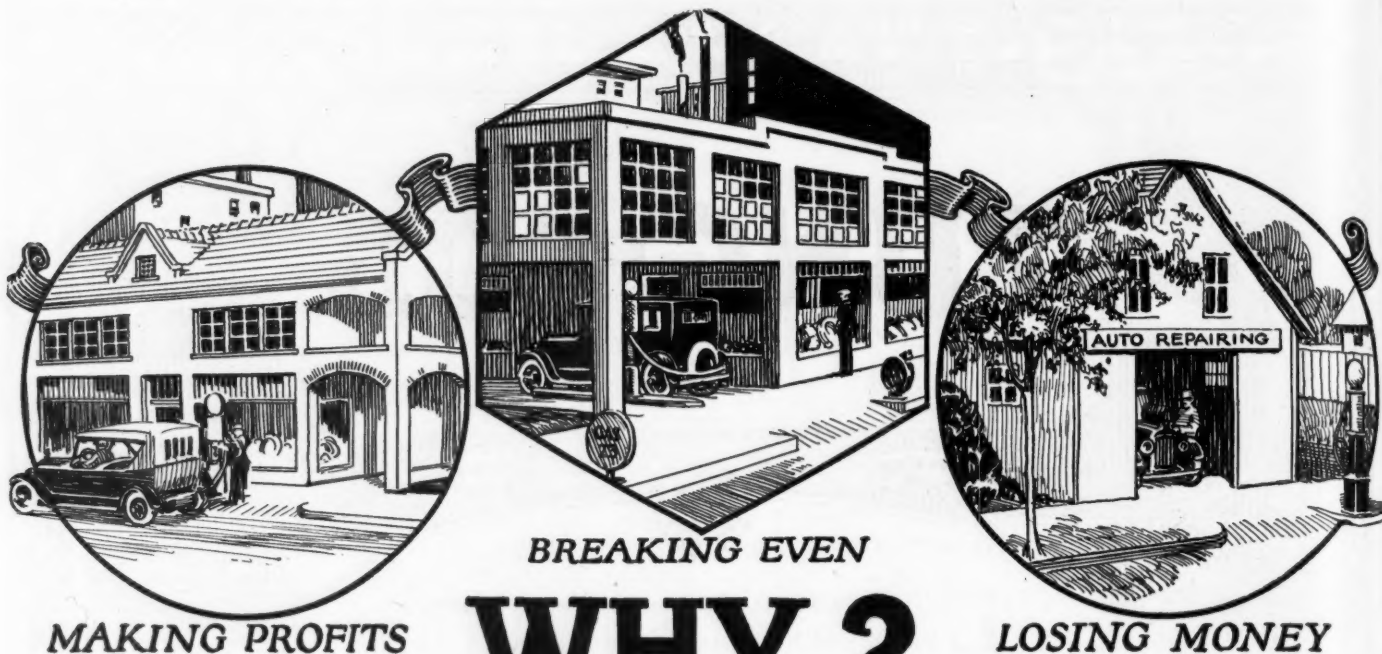
Newark

New Jersey

Licensed Under General Electric Company's Incandescent Lamp Patents.

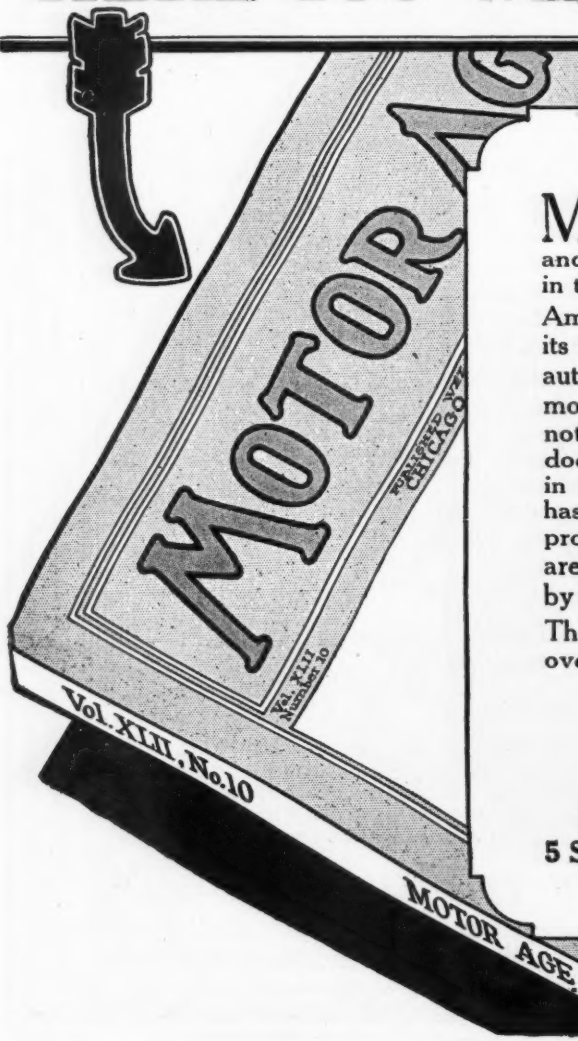


"LET TUNG-SOL LIGHT THE WAY"



WHY ?

HERE YOU WILL FIND THE REASONS



MOTOR AGE has set for itself a definite mission. It is a business paper of the automotive trade and concerns itself with the greater success of those in this tremendous field.

Among other important features, MOTOR AGE brings to its readers the fundamental reasons for success in the automotive trade. It tells why certain types of automotive merchants are successful and why others are not. It gets down to facts and specific reasons. It doesn't preach—it advises. As an influential factor in the progress of the automotive trade, MOTOR AGE has as one of its policies the belief that all of us can profit by the experiences of others. In every issue are found many valuable thoughts that were aroused by some dealer's experience.

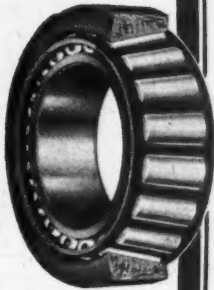
Thousands of leading automotive dealers the world over are thus profiting by these weekly messages.

MOTOR AGE

5 SO. WABASH AVE.,

CHICAGO, ILL.

Another 250,000 "Miler"



After delivering more than 75,000 miles of service to the City of Auburn, New York, this Model "D" 1911 Franklin, illustrated below, furnished Arthur Maddocks more than 175,000 miles of service without replacement of a single Timken Bearing. A total of 250,000 miles. 120,000 miles of these quarter million miles of service were delivered in and around the mountains of Colorado.

On the 28th day of April, 1923, Mr. Maddocks furnished the following affidavit made in Denver:

"During all the time I have had the car, which is from April 1, 1913 to date, the Timken Bearings were not replaced until April 22, 1923; and the Timken Bearings delivered to a representative of the Timken Roller Bearing Service and Sales Company are the same identical Timken Bearings that were in the car on the date purchased by me, and I have every reason to believe are the original bearings put in the car. From the present condition of the bearings in question, I believe they would easily last the life of the automobile, which is at this time in first class shape and which, during the next thirty days, will be converted into a service car to be used for towing."

Twelve years of service showing more than 250,000 miles without one single Timken replacement.

The Timken Roller Bearing Co
CANTON, OHIO

TIMKEN
Tapered
ROLLER BEARINGS



Timken Tapered Roller Bearings in this 1911 Franklin have delivered over a quarter million miles of service without replacement.

CHICAGO DAILY TRIBUNE



The Standard of Comparison

Enjoy Every Summer Day With a Buick Sport Car

Care-free vacation time has a perfect companion in the Buick Sport Touring car. Every line of its beautiful appearance, every sparkle of its luxurious fittings reflect the spirit of summer days with their many social enjoyments.

And the Buick Sport Touring car is more than a playtime motor car. It is suited to business and other every day motoring because it is a Buick—with all the traditional Buick dependable performance, ability and stamina.

Fours	
2 Pass. Roadster	\$865
5 Pass. Touring	885
3 Pass. Coupe	1175
5 Pass. Sedan	1395
5 Pass. Tour. Sedan	1325
Sport Roadster	1025

Sixes	
2 Pass. Roadster	\$1175
5 Pass. Touring	1195
5 Pass. Touring	

BUICK MOTOR COMPANY
Detroit, Mich.

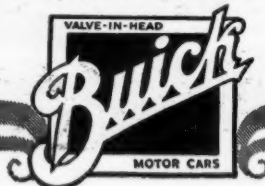
Buick Dealers Can Supply Every Motoring Need

The completeness of the Buick line is another asset to Buick dealers. Whatever the purpose for which a prospect needs a car there is a suitable Buick model. This is another reason why Buick dealers have sold over a million motor cars. Why not have your name on file?

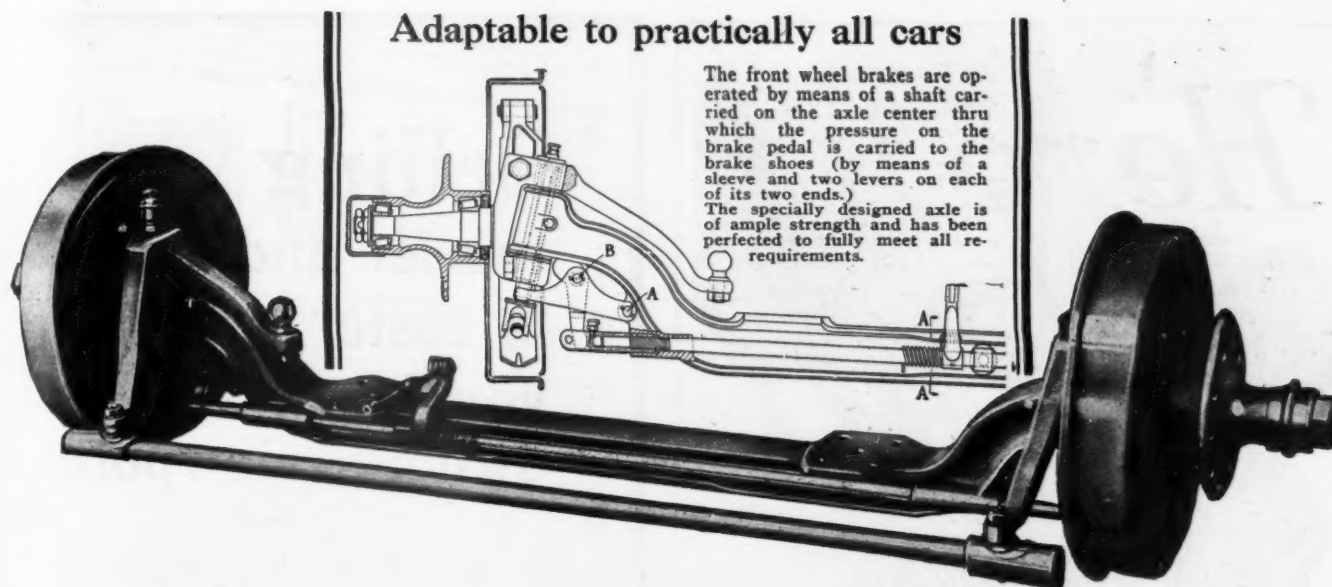
BUICK MOTOR COMPANY, FLINT, MICHIGAN

Division of General Motors Corporation

Pioneer Builders of
Valve-in-Head Motor Cars



Branches in All
Principal Cities



Adaptable to practically all cars

The front wheel brakes are operated by means of a shaft carried on the axle center thru which the pressure on the brake pedal is carried to the brake shoes (by means of a sleeve and two levers on each of its two ends.) The specially designed axle is of ample strength and has been perfected to fully meet all requirements.

An Opportunity for Dealers **FRONT WHEEL BRAKES**

Answer the Demand for Better Car Control

Front wheel brakes are here. The time is at hand when car owners will demand that means of better car control be made possible by brake applications on all four wheels.

The U. S. Axle Company, pioneers in this field of automotive manufacture, here announce a Front Wheel Brake Axle which fully meets the need.

The simplicity of this equipment is such that it readily lends itself to dealer installations for it can be hooked up to and equalized with any conventional rear axle or transmission brake.

And while it is simple, it is thoroughly efficient and effective.

The trend to four wheel brakes is gathering impetus every day—the time is not far distant when it will take form in a universal public demand—both for passenger cars and trucks.

The opportunity, therefore, for dealer profits on the device, as a replacement is great and will be greater.

If you see this opportunity as many other dealers are seeing it, you will apply for first chance on the local distribution of U. S. Front Wheel Brake Axles.

U. S. AXLE CO., POTTSTOWN, PA.

U.S. FRONT WHEEL

U S
FRONT WHEEL BRAKE
AXLES

BRAKE AXLES

*Here it
is -*



**As big in usefulness
as it is small in size**

"Yankee" Ratchet Hand Drill No. 1530 is only 10½ in. long. Weighs only 20 ounces. Yet it has five ratchet adjustments: (1) Plain Drill, (2) Left-hand Ratchet, (3) Right-hand Ratchet, (4) DOUBLE Ratchet, (5) Gears Locked.

In tight corners, DOUBLE Ratchet keeps drill cutting *continuously* even if you can move crank only an inch either way.

Some other "Yankee" Tools

Ratchet Screw-drivers
Plain Screw-drivers,
1½ to 30 in. blades
Ratchet Breast Drills

Ratchet Chain Drills
Ratchet Bench Drills
Ratchet Tap Wrenches
Bench Vises

Write today
for Free Tool
Book



Dealers everywhere
sell "Yankee" Tools

NORTH BROS. MFG. CO., Philadelphia, U. S. A.

"YANKEE" TOOLS
Make Better mechanics

Selling trucks and buses is easier when you know the owner's viewpoint

Read Motor Transport

It tells you the problems of the Fleet Owner. It tells you how Fleet Owners are making and can make a success of truck or bus operation.

Just as *Motor Age* tells you how to handle your business, so *Motor Transport* tells how to efficiently operate fleets of motor trucks and buses.

Reading *Motor Transport* will make you a better dealer.

Recommend fleet owners to whom you have sold trucks or buses to subscribe for *Motor Transport*. This magazine will make them more efficient operators.

You will both benefit!

Motor Transport is published semi-monthly, on the 1st and 15th. The subscription price is \$2.00 per year (\$2.50 West of the Mississippi).

Write for a sample copy.

**Motor
Transport**

FORMERLY COMMERCIAL VEHICLE

(Published by the Class Journal Co.)

239 West 39th St.

New York, N. Y.

SHALER



Your Customers Help You Sell 'em

Ask 'Em at the Pump—

"Got plenty of patches for your 5-Minute Vulcanizer?"

Dealers tell us that this method sells more than half of their customers. It sounds like a way to sell patches, but it has proved to be the easiest way to sell Vulcanizers.

"Increased Sales Wonderfully"

"Your 'ask 'em have you plenty of patches' idea, also the window display have helped us to increase our sales of Shaler Vulcanizers and Patch-&-Heat Units in a wonderful way," write Green Bay Supply Co., Green Bay, Wis.

Notice how the fellow, who has a Shaler Vulcanizer in his tool-box, likes to stop and "show" the out-of-luck motorist how much better it is than "stuck-on" patches.

Right away there is another convert to the idea of 5-Minute Vulcanizing, and the first dealer who has his stock of Shaler Vulcanizers out in sight grabs off an easy sale—and another booster is ready to show off for the next puncture-victim he finds on the road.

Get More Helpers

The more vulcanizers you sell, the more helpers you will have and the more repeat business you will get on patches to use with the vulcanizers.

Write us for free display material that definitely ties in your window with our national advertising and helps you to say, "Here it is!"

The complete line of Shaler Vulcanizers for tire repair shops, garages, and motorists' use, are sold in practically every wholesale auto supply house in the United States and Canada.



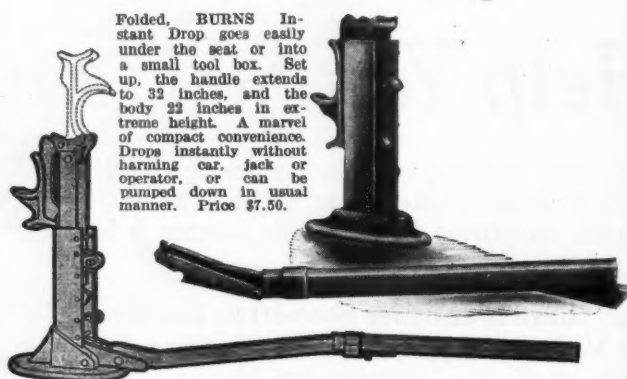
C. A. SHALER CO., 217 Fourth St., Waupun, Wis.



for
Ford
Star
Gray
Chevrolet
Overland

and all other light cars. Something the owners of such cars have been wanting for years. Now that it is offered at a really low price, you should have no trouble in disposing of a big stock quickly. One pressure of the foot lifts a light car to any of five heights. Another touch of the toe lowers it under full control. Speed, cleanliness, ease—all big, selling features. Being made of steel throughout, HENRY cannot be damaged by dropping or bumps. Having 26 square inches of base, HENRY does not sink into soft ground. Ask your jobber for a couple of dozen, and make some real, quick money. Price \$3.00.

BURNS Instant Drop



Folded, BURNS Instant Drop goes easily under the seat or into a small tool box. Set up, the handle extends to 32 inches, and the body 22 inches in extreme height. A marvel of compact convenience. Drops instantly without harming car. Jack or operator, or can be pumped down in usual manner. Price \$7.50.

JOBBER'S

Here are two jacks with exclusive sales features that make them go big wherever they are shown. Not just two more jacks, but feature jacks every jobber and dealer can sell. HENRY appeals irresistibly to the light-car owners—the biggest class of motorists. BURNS Instant-Drop gets the man with a large car, who doesn't like to crawl under it to place a jack, and who wants the job of tire changing over in a hurry. He gets both—at a profit to you.

With a market like that, and two articles fitting every buyer in it, neither jobber nor dealer can help making money. Ask for a sample at regular discount. Get quotations on quantity at once.

WOLVERINE
Specialty Company, Inc.
Battle Creek, Mich.



TRINDL

SERVICE



There's a Stock Near You

The list of jobbers stocking TRINDL Piston Pins and TRINDL Super Warp Proof Valves runs well up into the hundreds. These jobbers are located in all parts of the country and no matter where you are there is one near you. These jobbers can furnish TRINDL Quality Piston Pins and TRINDL Super Warp Proof Valves for all engines in regular sizes, standard oversizes and special sizes.

Learn to depend upon the quality of TRINDL products as thousands of service stations and repairshops are now doing. You will find the quality measures up to every standard you know of.

If you do not know the nearest jobber who stocks TRINDL products write to us for his name.

THE TRINDL CO.

2917 S. Wabash Ave., Chicago
Milwaukee Branch, 133 6th St.

Sales Offices:

NEW YORK, United Autoware Co., Fisk Bldg.
SAN FRANCISCO, Geo. R. Keith Co., 661 Turk St.
DALLAS, TEXAS, Wetherbee Bros., 515 Mercantile Bank Bldg.

TULSA, OKLA., E. H. Davis, 614 S. Denver St.

The TRINDL Company is not owned, controlled by or affiliated with any company or individuals outside its own organization.



Super Warp Proof Valves

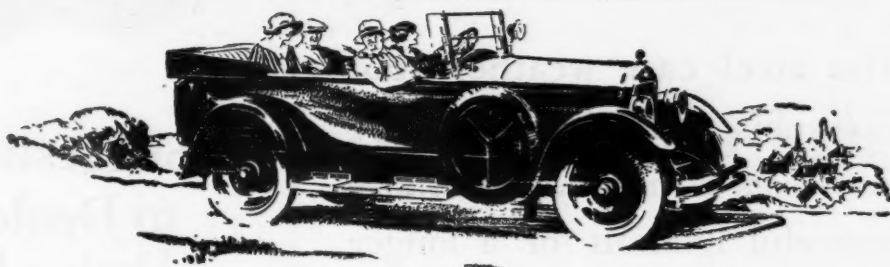
Used exclusively by hundreds of shops for replacement work. Large under-heads facilitate the intake and escape of the gases. Furnished with oversize stems to be used where guides are worn. Write for data sheet and price list.



The Sign of the Genuine

A Sportster Extraordinary!

THE SPORTABOUT



A bit of all right!—this Stutz Six Sportabout. It looks just as good as it acts.

In dashing Maroon, natty Fleetwood Blue or swanky Yellow; with jaunty sand-tinted, tailored top; heavily nickeled radiator and lamps to match, and fully equipped with the smartest of fitments, it has all the spirit and go that its name implies.

Upholstery is of brown Spanish leather. A spacious trunk of water-tight and dust-proof construction, containing two large suitcases, and covered with leather to harmonize with the body, reposes on the ingenious rack at the back.

The rear body panel is protected by burnished aluminum scuff rails.

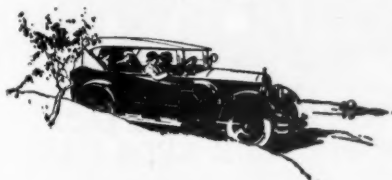
Highly polished step plates; nickel mounted side-windshields; a powerful spotlight; an automatic windshield cleaner; a rear-vision swivel mirror of finest plate; a sturdy double nickel bumper at the front, and two side-mounted spares with patent moleskin covers complete the picture.

The Stutz Six Sportabout is a five-passenger sportster of finest fettle—the happiest possible combination of sheer good looks and downright ability to perform. The price at the factory is \$2315.

The Sportabout is another example of Stutz over-value, another stellar attraction in the well-balanced Stutz line. The Stutz franchise is as good as the car. Why not inquire?

Touring Car	. .	\$1995
Sportabout	. .	\$2315
5-Pass. Sedan	. .	\$2550

f. o. b. factory



STUTZ SIX

It's a Great Car

STUTZ MOTOR CAR COMPANY of AMERICA, Inc., Indianapolis, Indiana
Builders of the Original and Genuine Stutz Motor Cars



The steel case weatherproof Columbia "Hot Shot" Battery that costs no more, gives more powerful ignition for a longer time, and builds up customer satisfaction for the dealer

3 good reasons why implement dealers concentrate on the Columbia Line

- prestige and sustained advertising in the farm field make Columbia the easiest and most profitable battery to sell
- quality insures customer satisfaction from every Columbia sale
- greater power and longer life have established Columbia supremacy for farm use

Concentrate on the Columbia Line and Cash In on the Features That Win and Hold Trade

Your Jobber Will Cooperate 100 Per Cent

NATIONAL CARBON COMPANY, Inc.
Long Island City, N. Y.

Atlanta Chicago Cleveland Kansas City San Francisco

Columbia
Dry Batteries
—they last longer



A Suggestion to Dealers of Dodge Brothers Cars

You can make ready sales to the owners of Dodge Brothers Cars in your territory with the Giant Shock Absorber which is built especially for this car.

This shock absorber adds so much comfort and pleasure to driving this make of car that once you have sold a set in your territory you will find that other sales come easy.

The unusual low price of \$22.50 for the complete set is another big selling point that attracts buyers. This is the lowest priced high grade absorber on the market.

We are now allotting territory to live distributors in different districts. Write for the unusual proposition made to distributors on the Giant Shock Absorber.

Red Giant Tool Corporation
Lynchburg, Virginia



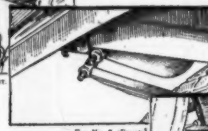
Giant

Shock Absorbers

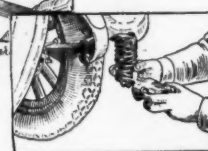
Built Especially for DODGE BROS CARS



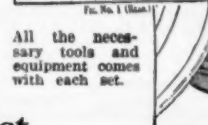
Front Spring—A heavy casting is provided for the front spring to take place of the shackle.



Can be installed in short time. Full directions come with each set.

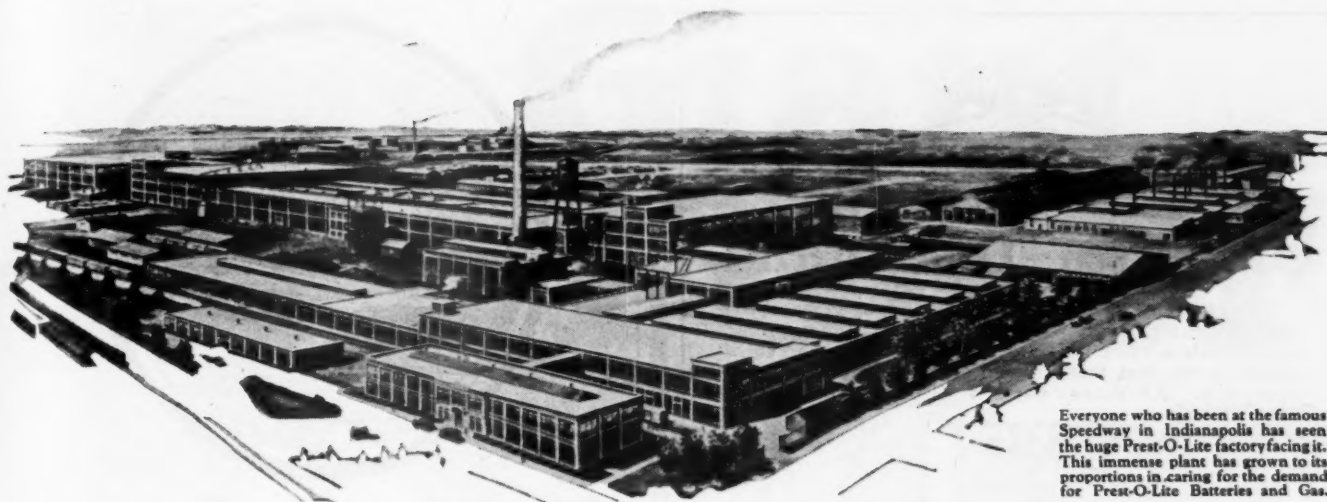


Needs no attention after it has been installed. Nothing to rattle or set out of order.



All the necessary tools and equipment comes with each set.

List Price
\$22.50
for Complete Set



Everyone who has been at the famous Speedway in Indianapolis has seen the huge Prest-O-Lite factory facing it. This immense plant has grown to its proportions in caring for the demand for Prest-O-Lite Batteries and Gas.

The demand for Prest-O-Lite Batteries built this plant

The great Prest-O-Lite factory emphasizes two vital facts: The steadily growing demand for Prest-O-Lite Batteries which made such a plant necessary, and the existence of an organization with the experience, ability and skill to produce the kind of a battery demanded by the motorist.

In this plant Prest-O-Plates were developed for the backbone of the battery. Combining

the necessary hardness with ample porosity, Prest-O-Plates provide immediate power and dependable reserve for emergencies. All other parts are on a par with Prest-O-Plates—a harmony of construction which makes Prest-O-Lite the best all-around, all-weather battery.

THE PREST-O-LITE COMPANY, Inc.
Indianapolis, Indiana

New York Office: 30 East 42nd St. Pacific Coast Office: 599 Eighth St., San Francisco
In Canada: Prest-O-Lite Company of Canada, Ltd., Toronto

THE OLDEST SERVICE TO MOTORISTS



Be a more prosperous dealer

Battery stations, service garages, automobile dealers and others who are live merchandisers and interested in having a prosperous, permanent business are invited to write us for our distributor proposition and plan.

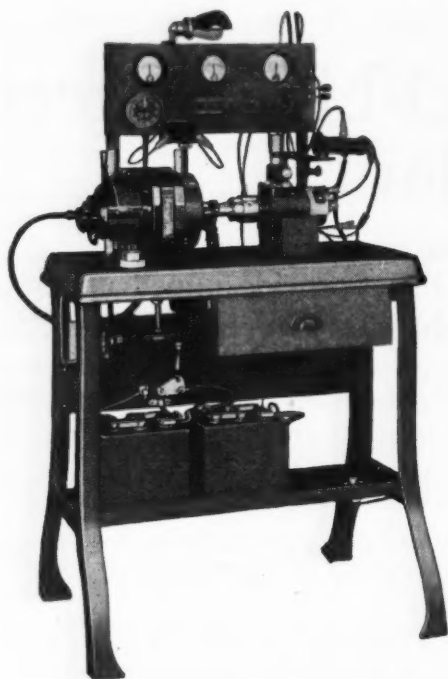


Universal Test Stand

Designed by G. H. Allen, long engaged in the manufacture of high grade electrical equipment for automobile service repair, the Allen Universal Test Stand is the last word in simplicity of design and operation. All excess parts have been eliminated.

\$375

Complete



A New Factor in Profitable Service

Three high grade meters with external adjustments show all readings required.

Shifting one lever controls the speed from P to 400 R. P. M. in either direction—power enough to pull any generator.

Throwing a single switch changes the entire stand from 6 to 12 volt testing.

Ignition system and generator can be tested at the same time.

Special adjustable clamping arrangement makes possible an instant grip on the generator after it is placed in hardwood "V" block. Thus cutouts, controllers, ignition heads or whatever is fastened to generator do not interfere. The firm grip prevents all vibration while test is being made.

Simple in design and compact, the Allen Universal Test Stand registers with absolute accuracy. We guarantee the Allen Universal Test Stand for one year against defects in materials or workmanship.

Write for complete details.

Allen Electric Manufacturing Co.

2206 Fort Street, West
Detroit, Mich.



Hot Weather Driving

In hot weather,—OIL, and lots of it, is the crying need of every Ford motor. How much oil can the Ford get if the oil line clogs? How long will it take to ruin the motor when it occurs? In hot weather particularly, it is very dangerous to drive without the security of a Ford Faithful Oiling System on your Ford. It is the positive assurance of 100% lubrication for motor and transmission, regardless of heat or hills.

Before the warm weather sets in or before you make that trip put on a "Ford Faithful" and you can rest assured that you will be free from trouble and expense.

Remember—an ounce of prevention is worth a pound of cure.

Order your Ford Faithful now, and eradicate the dread of hot weather driving.

Ford Faithful Oiling System

Complete

\$5.75

DEALERS Thousands of dealers throughout the country are making good profits and good friends with Ford Faithful Oiling System. Why not share in their success. Your line is not complete without this positive necessity for all Fords. Write Factory TODAY!

W. O. Thompson Mfg. Co.

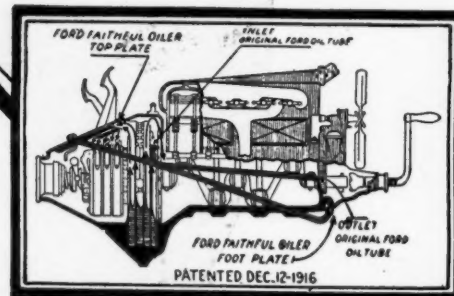
330 Mountain View St.

PASADENA

CALIFORNIA

Ford Faithful patents are being upheld. Infringers will be prosecuted to the full extent of the law.

FORD FAITHFUL OILING SYSTEM





Giant Power in the ROSE

HIGH PRESSURE LUBRICATING SYSTEM

Any man of average strength can create the terrific pressure of 1700 lbs. with a Rose High Pressure Lubricator in his bare hands. That's pressure to spare.

The Rose is guaranteed against fault up to 2000 lbs. pressure. Each gun is given a one-ton test with light oil before it leaves the factory.

Much of Rose popularity comes from its ease of operation. It fills itself. Merely loosen the feed nut and suck in a full charge of grease by a pull at the grip. To use: tighten the feed nut, snap the coupling in place and a couple of turns gives perfect lubrication with hundreds of pounds to spare.

This Rose System is a remarkably successful seller. Right in quality and right in price. If you do not carry Rose now, ask your jobber for complete information.

FRANK ROSE MFG. CO., HASTINGS, NEBR.

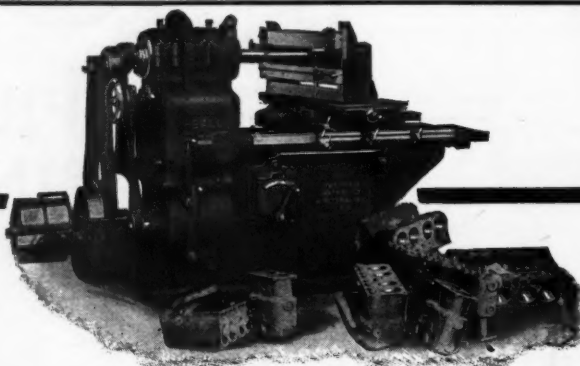
Repairmen and Motor Owners Unanimously for the HEALD

THE REPAIRMEN choose the Heald for its economy in producing the highest grade of work. The Heald Universal Jig permits quick set-ups and accurate location of the cylinder bloc regardless of size or type. Simplicity of control eliminates lost motion and accurately graduated dials supplant guesswork. Every factor for cutting time from floor to floor is incorporated in the design and the minutes saved on every bloc show in dollars in the day's profits.

THE CAR OWNER demands Heald regrinding because of its efficiency and economy. A Heald-ground cylinder is as perfect as mechanical means can make it. 90% of all motor manufacturers finish their cylinders by grinding and use Heald machines exclusively. Naturally the owners will want the same grade of finish when regrinding in order to maintain the high standard of their power plant.

If you are considering this work, visit several regrinding shops, get in touch with the manufacturers themselves, and finally question various motor owners as to what equipment they advise to handle this work so as to bring you ultimate success. Let us send you convincing literature or even give you a personal call. No obligation. Glad to do it.

**The Heald
Machine Co.**



**61 New Bond St.
Worcester, Mass.**

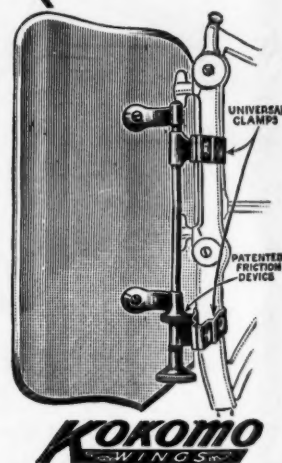
Sedan Comfort In An Open Car

There's comfort behind Kokomo Wings even in a 60-mile breeze. They divert wind, rain, dust and dirt from the car, yet do not rob you of the invigorating fresh air. You can smoke in comfort without danger to fellow passengers. The ladies need no superfluous veils or head gear.

Kokomo Wings

The patented friction device on Kokomo Wings stands in definite tightening and releasing. Always holds firmly against wind or vibration. Glass rides on rubber cushion—no metal touches glass. Will not loosen; no danger of breakage. Made of selected quality of glass, artistically shaped and beveled. Mountings finely finished.

Kokomo Wings, Per Set.....	\$22.50
Hoosier Wings, Per Set.....	18.50
Eagle Wings, Per Set.....	17.00



PAT'D. JUNE 7, 1921. OTHER PATS. PENDING

are standard equipment on Buick, Haynes, Apperson Reo, Winton, Durant, Mitchell, Earl, Oldsmobile, Velie, Anderson, Saxon, Briscoe and other cars.

Kokomo Mirrors

Let the motorist know what is going on at his back—a big safety feature, and a convenience. Made of highly polished, beautifully beveled plate glass of selected quality. The mountings are high-class in every respect. Type A and C for closed cars—

Type B for open cars.

10 in. Kokomo Mirrors, Type A, B or C.....	\$3.00
8 in. Kokomo Mirrors, Type A, B or C.....	2.50

Manufactured by

Kokomo Automotive Mfg. Co., Dept. 15-K, Kokomo, Ind.

Sales Representatives

The Fulton Company, Milwaukee, Wis.



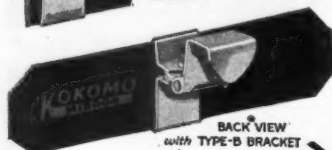
FRONT VIEW



TYPE-C
BRACKET



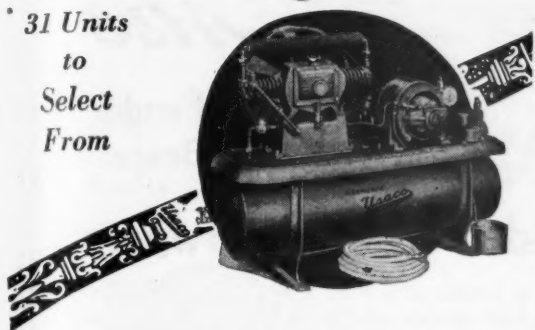
TYPE-A BRACKET



BACK VIEW
with TYPE-B BRACKET

Two Stage

31 Units
to
Select
From



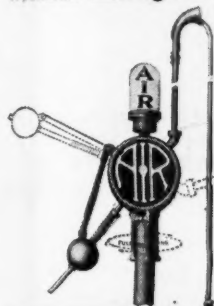
This illustrates the head of the Usaco "Perfect Balance" Service Tower which embodies many exclusive improvements.

It revolves easily on ball bearings without strain on tower, arm or hose.

The arm is in "Perfect Balance." After serving air it returns to vertical without the slightest strain and without lashing the hose. The absence of springs, oil checks and heavy weights assures long life with uninterrupted service.

The attractive light is water-proofed to protect against rain.

Write for a circular describing this masterpiece.



THE UNITED STATES AIR COMPRESSOR
COMPANY

5304 Harvard Ave. Cleveland, Ohio

For Compressor Satisfaction just say *Usaco* "u-say-ko"

For many years Usaco Air Compressors have led the field in filling station installations. Many companies have adopted them as standard.

Patented devices protect against changing current conditions. Automatic control assures continuous service without attention. High pressure service satisfies and makes steady customers. High standards in material and workmanship afford unprecedented long life.

To protect yourself in buying air compressors just say, "U-say-ko" and accept no substitute. Meanwhile ask us to prove why the Usaco is "By Far the Best by Every Test."



20 Units to
Select From

Single Stage

Here's a New One!

-another member of the **TEMCO** Heavy Duty Family

For some time there has been a need for a small type of Drill suitable for hard service. After a careful study of the requirements we perfected our Model "D", 1/4 inch Heavy Duty Drill to meet the need, and this new Drill is now ready for distribution.

Our Model "D" is typically TEMCO in quality throughout. Has a fan-cooled motor which runs on Norma Ball Bearings, making it surprisingly quiet in operation. Full automatic switch in handle which shuts off current the instant handle is released.

And it weighs only five pounds, —easy to operate with one hand and mighty convenient for drilling in hard-to-get-at places. Ideally suited for use of garagemen in mounting auto accessories, etc., and for use on sheet metal and wood working jobs.

In other words, the Temco Heavy Duty Family supplies the necessary equipment for successfully handling the roughest and toughest jobs that come along;—drilling, reaming, tapping threads, honing cylinders, lapping pistons, grinding valves or doing any of the dozen-and-one things which are daily jobs in the average shop.

You never need worry with a Temco! They are designed to give service;—built to "deliver the goods." That's why they "Take the Drudgery out of Drilling."

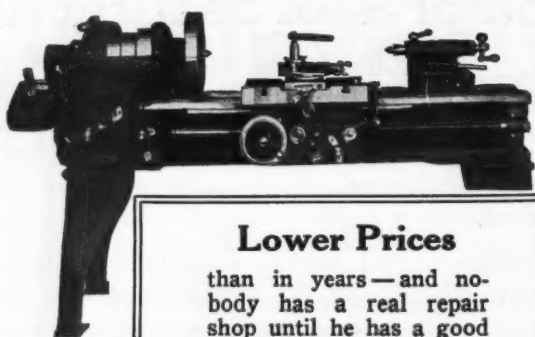
And remember, we also make a full line of Bench and Pedestal Grinders.

Ask your Jobber about the TEMCO line. If he can't supply you, write direct giving your Jobber's name.

The Temco Electric Motor Co., 707 Sugar St., Leipsic, O.

P. S.—Did you hear from Tim? If not, send along your address. There's a letter for you.





Lower Prices

than in years—and nobody has a real repair shop until he has a good engine lathe.

Remember, "The Well-Equipped Shop gets the business."

We specialize in lathes for garages and repair shops. Twenty years' experience has made C-J Lathes greatest value possible.

13, 15 and 16 inch swing, 5 to 12 foot lengths.

Before buying anywhere, send postal for our Bulletins and Special Price Discounts.

Carroll-Jamieson
Machine Tool Co.
Batavia, Ohio



Handy Ben
TRADE MARK

**VISIBLE
Oil
Pump**

MY NEW VISIBLE OIL PUMP is doubling oil sales and profits for users—In fact:—day after day letters keep coming in from trial customers stating that they wouldn't be without it.

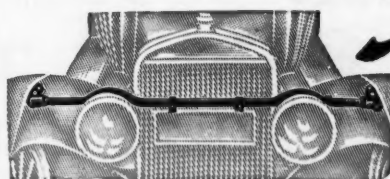
You can imagine the talk my HANDY BEN grease pump is creating in easily passing the 10, 15 and 25 barrel mark in year 'round weather. My Visible Oil Pump is only \$14.75. My Grease Pump — only \$12.50. Special Barrel Truck, \$6.50. Order one of each ON TRIAL at my risk.



Ben Bennett
PRESIDENT

BENNETT INJECTOR COMPANY

Inventors and Manufacturers of Grease and Oil-Handling Devices
MUSKEGON, MICHIGAN



ARG

**Fender
Braces**

Needed by Ford Owners

Here is a fender brace for Ford Cars which performs a real service and adds greatly to the car's appearance. The ARG Fender Brace prevents rattling and vibration, thereby lengthening life many times over, and prevents fenders from sagging and cutting tires, as well as prevents damage in many instances.

It makes an ideal support for license tags, or other plates used for identification such as names of towns, lodge emblems, civic organization name plates, clubs, colleges, etc. Does not touch lamps or radiator.

Easy Installation

Easy installation makes sales otherwise impossible—no holes to bore, permitting try-outs by your sales prospects who would object if boring were necessary. A trial convinces.

Manufactured by

ARG Auxiliary Spring Co., Inc.
Dept. 4, Birmingham, Ala.

KOZY WINGS

THE ORIGINAL



Selling Fast

at

New Prices

Smart—trim—built to conform to cowl and dash design of each particular make of car. No holes in glass. Rubber footed clamps hold glass tight. No rattle. Heavily nicked, highly polished cast brass metal parts. The popular Wing at a popular price. Reach every car owner.

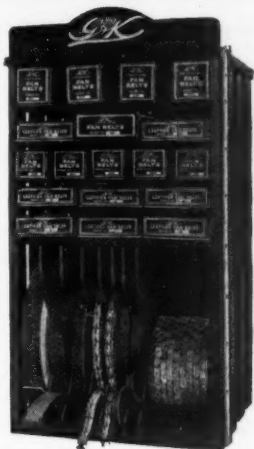
Dealers: Get quotations from your Jobber today. Cash in on Kozy Wing popularity. Full details on request.

The **MID-WEST GLASS Co.**
CINCINNATI OHIO, U.S.A.

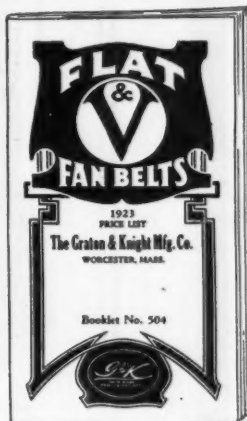
IT IS OUT!

G. & K. BOOKLET No. 504

The Complete Fan Belt Data Book



+



IT WILL HELP YOU SELL
G. & K. LEATHER
FAN BELTS

REAL STEER HIDE BELTS; NATURAL COLOR

The Graton & Knight Mfg. Co., Worcester, Mass.

He Charges less
but
Makes more
with
AUTO-HONE

A garage man in the West collected \$244.00 in one week for HONING CYLINDERS with Auto-Hone besides his profit on new pistons, rings and pins. He did SIXTEEN jobs in one week—charged less than the regular rate for resizing cylinders and made more money. He gave quicker service and did finer work.

YOU CAN DO THE SAME

Auto-Hones are made in two sizes:
For cylinder 2 13/16 to 3 3/8 bore\$85.00
For cylinder 3 3/4 to 4 1/4 bore 95.00

A complete illustrated direction sheet accompanies each tool which enables you to do perfect work right from the start.

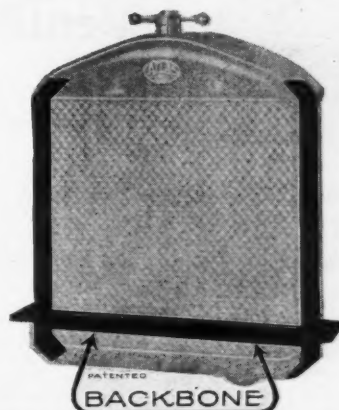
Don't overlook this opportunity. Send your order in or write for information today.



Slip Auto-Hone into cylinder—connect its steel driving handle to your electric drill—turn on the power—and the work is started. The AUTO-HONE is designed to remove metal as well as burnish and polish the walls. Pressure on the stones is regulated from the driving end of the tool. As the stones are forced out radially, the AUTO-HONE centers itself. No expert help needed.

CYLINDER
THE AUTO-HONE CO.
GENERAL OFFICES 1587 MAIN STREET
BUFFALO, N.Y., U.S.A.

"ATLAS" RADIATORS
For FORD CARS



See That "Backbone"!

In this "Backbone" feature is embodied the only scientific principle, both from the engineering and practical point which will safeguard the honey-comb core against road shocks and the strain of the chassis as it replaces the tie bar which is standard equipment and a very es-

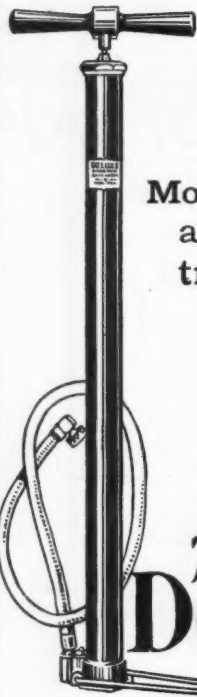
sential part of the Ford car frame.

The "ATLAS" is the only honey-comb radiator that replaces this chassis tie bar. That's why the "ATLAS" gives such satisfactory service.

The price and discounts are right; write us for further details.

THE STEIDLE MANUFACTURING COMPANY
Cincinnati, Ohio

DE LUXE Products
For the Automobile Owner



More than a pump—
a friend, loyal and
true under any
condition

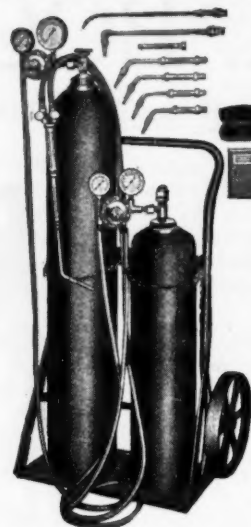
ORDER DIRECT
SPECIFYING
JOBBER

The DeLuxe
TIRE PUMP

Also
ARVIN HEATERS
DE LUXE,
DE LUXE VENTILATORS

INDIANAPOLIS PUMP & TUBE CO.
INDIANAPOLIS

MAKE EXTRA PROFITS WITH A WELDING OUTFIT



Smith No. 62 Welding and Cutting Outfit.

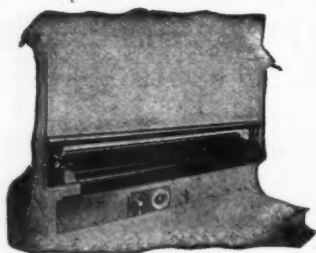
There are extra profits for the garage or service station that installs Smith Welding and Cutting Equipment. A surprisingly small investment will enable you to keep these profits to yourself, and besides make yours a faster, better service.

Ask us to show you how small an outlay will start a Smith outfit earning you this big extra money.

**SMITH'S
INVENTIONS
INCORPORATED**

MINNEAPOLIS

Exclusive Manufacturers of
Welding and Cutting Equipment



Perfect Ventilation

Reduces discomforts
of hot weather driving

The Phillips "Keep Kool" Ventilator is new—something to make the driver more comfortable and keep him in a happy mood. Ford owners will be glad to know about it. Show it to them.

7 REAL ADVANTAGES

1. Gives more ventilation than a tilted windshield or any other ventilator on the market.
2. Directs cool air on the feet of the driver.
3. Absolutely rain tight when closed—protects the coil box.
4. Made to fit standard Jobbers and Dealers. This is a thoroughly tested article—guaranteed. Sells readily and at a good profit.
5. Adjusted in an instant—no screws to make tight or loose.
6. Can be locked in any position and does not rattle.
7. Adds to appearance of the car and very easily installed.

Distributors Wanted! Write for your territory now!

F. C. PHILLIPS CO., Stoughton, Mass.
Manufacturers Screw Machine Products.

Not a Specialty



A Necessity

The National Automobile Shows Wonder Sensation UNIVERSAL AUTOMATIC SPRING OILER

Discovered and invented by Grus

Astounding and Unbelievable results

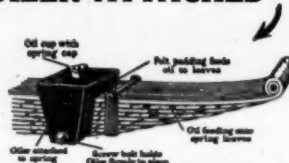
**GIVES PERMANENT
RELIEF FROM SPRING
SQUEAKS
OILER ATTACHED**

The Perfect
Leaf Spring
Lubricating
System

Retail Price
Regular Sizes
75c each

Complete Set of
Four for FORDS
\$2.50 per set

MANUFACTURED UNDER
GRUS BASIC PATENTS



Just think of it, no more broken springs; no more rusted springs; no more squeaky springs; no more inactive springs; no more wasted oil.

THE UNIVERSAL AUTOMATIC SPRING OILERS make your car run smoothly, easily, quietly, comfortably, begin immediately to lay a thin film of oil between the spring leaves. Just slip the oilers over the spring directly back of the spring clip and they are there to stay—will outlast the car.

Sold at
Accessory Stores, Garages, Department and Hardware Stores.
If your dealer does not handle them, order direct. It takes two oilers for each half spring—one for each quarter spring.

A Few State Distributors Wanted—Write Quick

The Universal Spring Oiler Company
Dept. E Medinah Bldg., Chicago, Ill.
"SEVEN FACTORIES"

ANNOUNCING NEW MODELS

MASTER TRUCKS

A Complete Line

SPEED MASTER— $\frac{3}{4}$ to $1\frac{1}{4}$ -Ton.

Highest Achievement for Fast Transportation

HEAVY DUTY MODELS— $1\frac{1}{4}$ to 6 Ton.

Every Master Truck built of highest grade recognized standard units, balanced oversize throughout. New models are the result of eighteen years' experience in successful motor truck building.

Write for specifications and liberal proposition to live dealers. Valuable territory still available.

MASTER MOTORS CORPORATION

2381-2399 Archer Ave.,

CHICAGO, U. S. A.



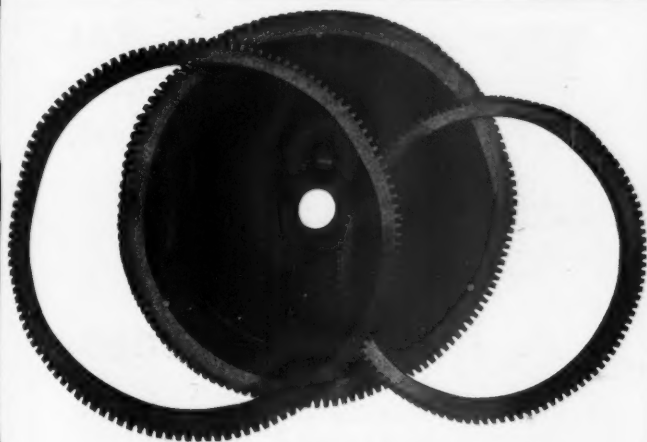
Music Under the Hood

means an engine with every spark plug keyed up right. You sing along the road, and hum up the hills all day. But let the insulator of one plug fail, and the whole motor's out of tune. Opinions differ about which spark plug is the best, but there's a high sign on practically every good one, and drivers of long experience look for it—that "775" on the insulator. Manufacturers recognize the superior endurance of "775" insulators and use them on the best plugs. They don't increase the price either. Make sure you get the right insulators by looking for "775" on every plug.

"Established 1910—
Busy Ever Since"

Frenchtown Porcelain Co.
Trenton, New Jersey

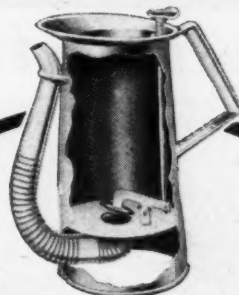
STANDS THE TEST



New Low Prices On Fly Wheel Rings

Increased quantity production has enabled us to get out a new and lower price list on Meachem Steel Gear Rings for Fly Wheels. Also our trade discounts have been increased to more than offset the lower list prices. Write us for the new list and discounts.

The Meachem Gear Corp'n.
Ring Dept. Syracuse, N. Y.



The One-Trip Measure

The average car requires just one gallon of oil to fill the crankcase. And with the gallon size of the Brookins Measure, that means just one trip to the tank for oil. Saves time for you and your customers.

There are quart and two-quart sizes, too, all copper finished. And all Brookins Measures have the flexible metal nozzle that reaches the most inaccessible oil hole. No oil flows before you are ready. A thumb-valve controls that.

The Brookins is the one best measure for every filling station and garage. Write for sample and prices.

Insist on a Brookins Measure when buying your new oil dispenser.

THE BROOKINS MFG. CO., 167 Bayard St., Dayton, Ohio

Export Office, 11 Broadway, New York City.

Cable—Address, "Brookins" New York, All Codes Used.

Brookins

ALL-IN-ONE LIQUID MEASURE

KEYSTONE

THE GENUINE



INITIAL RADIATOR CAP

Self-locking

THE Keystone Radiator Cap locks itself. Just screw it on and both the cap and the motor meter are theft-proof—no keys or chains. There is no device on the market that will so enhance the beauty of the forward end of your car and the cost is trifling.

Die cast, beautifully finished, rust-proof, water and steam tight. Cannot stick or freeze and radiator fills without removing or turning cap.

Distinctive initial or emblem plates furnished in aristocratic design and finish. Made to fit all cars.

The Keystone Jr. functions similarly except designed especially for Ford, Gray, Star Coupe and Chevrolet 490 cars.

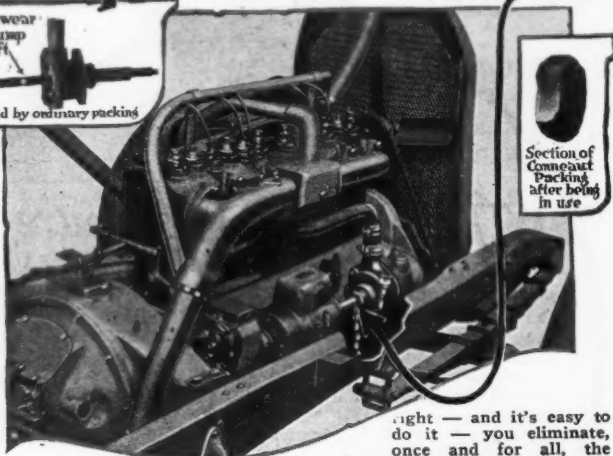
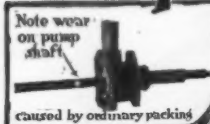
Minimum investment carries sufficient stock—quick turnover—liberal proposition for dealers. Write.

THE NORLIPP COMPANY

568 W. Congress St.

Chicago, Ill.

Stop That Leak



Section of Conneaut Packing after being in use

You know the difficulty of packing a troublesome water pump on an automobile. You know the tendency it has to leak all the time—and the more you tighten the packing nut the more the shaft wears.

What will stop it?

A metal packing—plastic in form—that you can mold quickly with the fingers to fit a stuffing box of any size—and that will seal pump shafts **TIGHT** even after they have become worn and are difficult to hold with other packing methods.

Once this packing is installed

“Conneaut” PLASTIC METALLIC PUMP PACKING

you know what the customer is going to say to that.

This is exactly what “Conneaut” Plastic Metallic Packing does—and it does it all easily, quickly, and so effectively that years of long service are the result. A smooth, metal bearing—adjustable and practically frictionless. Service and Garage Managers—“Conneaut” does the trick. Get it from your Jobber today. Try it once and you’ll always want it. Don’t forget—order today. Your Jobber has it. If your jobber does not carry it write us direct. Put up in pound cans, price \$1.65 F. O. B. Conneaut.

Effective!



Harmless!

The Laugh's on Tar!

You can't nurse a grouch when Pontoklene's within reach. Pontoklene removes tar and grease absolutely, without injury to the finest automobile body finish. It brings a smile to Mr. Auto Owner when he sees the spots disappear and the original lustre shine out. Order from your jobber today. Retail at \$1.00 a can.

THE PONTOKLENE COMPANY

2604 Main Street

Norristown, Pennsylvania



Reg. U. S. Pat. Off.

YALE Oiling System For Ford Cars and Trucks

Their steady sale and resale, the lack of complaint from buyers and the enthusiasm of dealers and jobbers handling them, show that YALE Oiling Systems are

A Proved Success

no matter how you take them. When you can put one on a Ford car or truck in twenty minutes, you are making an easy profit, for you get paid at the rate of about seven dollars an hour. When you can do that ten or twelve times a week, you are getting a good profit, for your investment is very small.

One Ford dealer figures that every YALE Oiling System pays for itself and \$6.00 over within 90 days on his Ford. With a story like that to tell customers, do you wonder that sales are easy to make?

For the convenience of dealers and jobbers east of the Mississippi we have opened an office in Philadelphia. Write to the nearest one for our sales-plan and the helps we furnish to make selling even easier. Write now.

ROLAND & KOCH

411 S. Main St.
Los Angeles, Cal.

2715 N. Broad St.
Philadelphia, Pa.

ACCURATELY MACHINED **SEMI-STEEL REPLACEMENT PISTONS** ACCURATELY MACHINED



For replacement work after a rebores or re-grind job insures your customer as good if not a better job than the original assembly.

Dall Pistons are simply **GOOD** Pistons, made to manufacturer's specifications, sometimes more refined in design and lighter in weight, but always as carefully made and inspected as though they had to pass the most rigid inspection of a Motor Manufacturer.

Dall Pistons are regularly furnished in standard and various oversizes, also semi-finished 1/16 oversize.

Write today for price list and delivery schedule on all items. Distributors at various points will take care of your requirements.

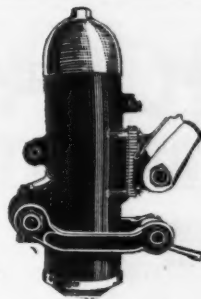
THE DALL MOTOR PARTS COMPANY

Post Office Station D, Cleveland, Ohio

Southwestern Branch

THE CARROLL CO.

2218 S. Harwood St., Dallas, Texas



**Let us
Tell you**

about the most wonderful shock absorber made.


Easily installed — easily sold.

Consists of a cylinder, three springs, and two pistons—that is all.

But oh boy!—how it does take out those bumps.

Don't believe us—let us show you. Allow us to demonstrate to you.

Would you care to have full facts?

**The World's Largest
Ball Plant**

**STEEL
BRASS
BRONZE
MONEL METAL
BELL METAL
ALUMINUM
AND HOLLOW BALLS**

HOOVER STEEL BALL CO.
ANN ARBOR, MICH.

BEST QUALITY



ATTRACTIVE PACKAGES

VICTOR-PENINSULAR CO.

DETROIT, MICH.

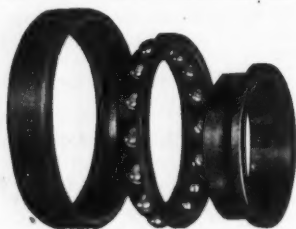
We Know What the Dealer Wants

From our own experience as dealers, we know exactly what the dealer wants. We are giving it to him in our 1923 dealer sales plan.

Write or wire for details today

Englert Manufacturing Co.
Pittsburgh, Pa.

Dragon Storage Battery



The Bearings Company of America,
Lancaster, Penna.

Manufacturers of—Angular Contact Radial Bearings, Angular Contact Thrust Bearings, Thrust Ball Bearings. All Bearings made to your requirements and Blue Print dimensions. Your present Bearing sizes duplicated.

Western Sales Office

1012 Ford Bldg.,
Detroit, Mich.



E-C-L Pistons

ALUMINUM ALLOY NON EXPANDING



How to Eliminate Piston Slap

Piston Slap is a common and vexatious cause of engine trouble which in the past has bothered most car owners. But it can now be eliminated. With the E. C. L. Aluminum Alloy Non-Expanding Piston. E. C. L. Pistons may be fitted with a closer degree of clearance than cast iron pistons. They reduce the consumption of gas and oil — increase power and speed and eliminate spark knocks. Let us tell you more about this remarkable piston. Write for the details today.

E. C. LONG

Main Office and Factory

4834 Beaubien Street

Detroit, Mich.

PAROB EXPANSION HAND REAMER

BLADES CUT AT
DIFFERENT ANGLES

Each successive blade
cuts AT A DIFFER-
ENT ANGLE
from the one
before it.

No CHATTER,
no DIGGING IN—
even in keyed holes.

TWICE the expansion of others. All
sizes. Money-back guarantee.

Ask about the GAMMONS TAPER PIN
REAMER—Wonderful Time-saver.

THE GAMMONS-HOLMAN CO.

Dept. C.

Manchester, Conn.



FORD OWNERS

NOW YOU CAN HAVE

THREE-SPEED Transmission

A three-speed forward, one reverse and replace the regular Ford Transmission, drums, bands and all—the low speed lower than the Ford low, therefore more power, the third or high is the same as the Ford high, and second is half way between.

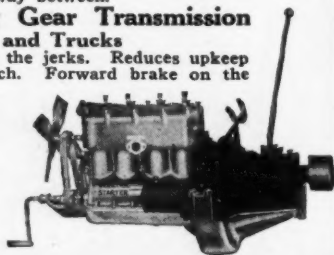
Cronk Simplex Sliding Gear Transmission

For Ford Cars and Trucks

Saves rear axles by eliminating the jerks. Reduces upkeep on engine. Multiple disc clutch. Forward brake on the jack shaft outside of case. Ruggedly built with oversize alloy steel gears, Hyatt Roller and Genelite Graphite-Bronze bearings. Installation easy. No cutting or machining.

Write today for other interesting details.

E. D. & A. F. Cronk, Inc.,
140 Hotel St., UTICA, N. Y.



MR. RADIATOR REPAIRMAN



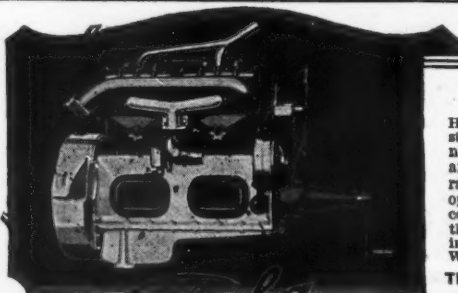
Make your own radiator cores and save 20% to 50% of their cost, give your customers quick service and a better core for less money. No need to carry large stocks of cores, and no damage in shipping. Increase your volume of business. Send for illustrated booklet describing our radiator core equipment.

Write for information to

Radiator Engineering Co.

626 Nesselwood Ave.

Toledo, Ohio



Negligible Upkeep

High performance standards of the new Waukesha Bus and Truck Motor radically reduce operating costs and continuously keep them at the minimum.

Write for details.

The Waukesha Motor Company
Waukesha, Wisconsin

Waukesha
TRADE MARK

BUS and TRUCK MOTORS

PARANITE CABLE

Best for Automotive Work

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought **PARANITE** Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.



FOR 33 YEARS THE STANDARD
IF IT'S **PARANITE** IT'S RIGHT
Quality jobbers handle quality cable—that's **PARANITE**.

Indiana Rubber & Insulated Wire Co.

810 Marquette Bldg., Chicago
Factory and General Offices—Jonesboro, Ind.

TASGON

has a thousand rust-dissolving duties in any shop

With a can of TASGON in his private garage, a motorist can keep his engine and valves forever free of carbon and its annoying influences.

He can feed TASGON to his springs—it works between the leaves, removing rust if it's there or preventing its accumulation, if not.

He doesn't have to bark his knuckles, or lose time and patience fuming over a "frozen" bolt or nut, for a few drops of TASGON will quickly penetrate the affected thread surface, lubricate it—and free the part.



Dealers and Jobbers will find it well worth while to learn the details of our trade offer—and send for discounts, counter displays, sales helps, etc.

Likewise "frozen" door hinges or locks, rust-marred nickel or metal surfaces are immediately rid of this offending substance.

Write for the unusually interesting details of the rust and carbon-melting material.



POLYGON PRODUCTS COMPANY
141 Milk Street Boston, Mass.

TASGON — The Magic Fluid That Dissolves Rust

ADPASCO TREATED GASKET PAPER



For Paper Gaskets In Automotive Work

Where gaskets are not exposed to extreme heat, use Adpasco. No longer necessary to use expensive asbestos sheet here. Adpasco is specially treated so it will not rot out and crack like ordinary paper makeshifts. Pliable, soft, holds its shape. Easily cut with knife or hammer head.

Approx. weight 12 oz. Size 36x40 in. Sold by over 400 jobbers. Used daily in thousands of shops.

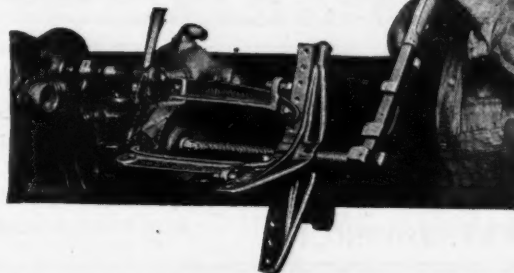
ADVANCE PACKING & SUPPLY CO.

62 East Lake Street

Chicago, Illinois

Pacific Coast Distributor: Allied Industries, Inc.
San Francisco, Los Angeles, Seattle.

Nothing Is Tight To This "Crowfoot" Model



Latest design in a family of wheel pullers. A two-arm or three-arm model as you require—a UNIVERSAL Wheel Puller.

Arms drop forged from high carbon steel, screw case hardened with inserted hardened tool-steel point. Guaranteed against defects.

Made in 4 sizes. Other models, too. Equipped with LOCKING Arms.

Our 24-page folder tells all there is to know about pulling tools.

CRANE PULLER CO.
ARLINGTON, MASS.

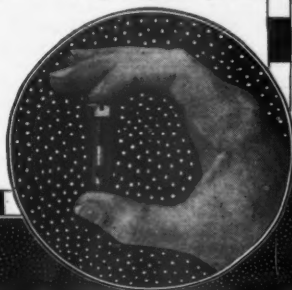
KING QUALITY PISTON PINS

Do you know how big your market is? Write for our booklet on "The Potential Market for Replacement Piston Pins." It applies not only to piston pins but to other lines as well. It will help your sales.

**PISTON PINS
PISTON PIN SET SCREWS
STEERING KNUCKLE
BOLTS and BUSHINGS**

All King Quality Products conform to the same standard of excellence

**Automotive Division
KING SEWING MACHINE CO.**
Buffalo, N.Y. Bridgeburg, Ont., Can.



LONG-LIFE Kokomo TIRES AND TUBES

KOKOMO RUBBER CO., Kokomo, Indiana
131 South Main St.

Kokomo Long Life tires and tubes make money for dealers who handle them.

Kokomo Twin-Grip Fabrics
Kokomo Two-Grip Cords
Kokomo Everlast Red Tubes
Kokomo Standard Gray Tubes



F-40 For Fords

and Chevrolets. A thrust bearing for the differential. Makes 'em push easier, climb better, dodge axle trouble.

Bantam Ball Bearing Co.,
Bantam, Conn.



BOSCH

American Bosch Magneto Corp.

Main Office and Works: Springfield, Mass.

Branches:

New York, Chicago, Detroit, San Francisco

Over 500 Service Stations in 500 Centers

Trade Mark Reg.
U. S. Pat. Off.

FISK TIRES

There's a Fisk Tire of extra value in every size,
for car, truck or speed wagon

SILENT TIMING GEARS IN MANY LEADING CARS ARE
MADE FROM



The Formica Insulation Co., 4642 Spring Grove Ave., Cincinnati

GRINDING
MACHINES

BORING
MACHINES

LANDIS

LANDIS TOOL COMPANY

WAYNESBORO, PA.

NEW YORK OFFICE:
51 Chambers St.



Relio, an electric-drive wet grinder for pistons, pins, valves, bushings, \$475.00.

Valvo, an electric-drive bench grinder for valves, valve-seat reamers \$175. See page ads this paper.

Van Norman Machine Tool Co.
Springfield, Mass.

LINCOLN

FOR ALL CARS—\$15 to \$36

SHOCK ABSORBERS

bethlehem betterments

for Motordom
Utilities—Not EXCESSories!



WATERVLIET SPIRAL EXPANSION REAMERS

Assure perfect fitting piston pins.

WILL NOT
CHATTER

Ask
Your
Jobber or
Write for Literature

Watervliet Tool Co., Inc.
Albany, N. Y.

New York
17-21 W. 60th St.

San Francisco
661-665 Turk St.

CYLINDER HONES

Can be operated without removing engine from vehicles. An absolutely true hole. Small first cost. Large profits. Have efficiency of large, expensive grinders.



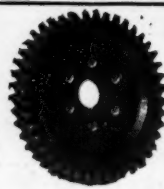
KALAMAZOO

MICHIGAN

INTERNATIONAL MOTOR TRUCKS for low-cost hauling

Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck. Some territory is still open for dealers.

International Harvester Company of America
(Incorporated)
Chicago, U. S. A.



Textolite

TIMING GEARS

A General Electric product. Made entirely of cotton fabric processed to wear like iron. Eliminates all noise from the timing gear assembly. For practically all cars. Write for prices.

JOHN C. HOOF & CO.
157 W. Illinois St. Chicago

C. P. C. STEERING GEAR

FOR FORD CARS AND TRUCKS

Makes the Ford steer like a big car. Stops vibration through the steering wheel. Absorbs shocks. Prevents "locking." Banishes steering fatigue. Learn the secret of balanced pressure. Write for descriptive literature and details of trade proposition.

THE RECORDING DEVICES CO.,
12 Norwood Avenue, Dayton, Ohio

ALVORD QUALITY TOOLS



Taps, Dies, Cutters, Drills, Reamers
Send for Catalog

ALVORD REAMER & TOOL COMPANY
Millersburg, Pa.

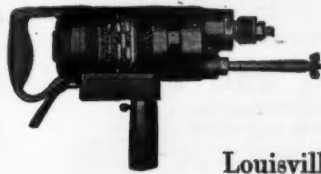


"In Stock -
Not Over a Day Away"

Write Milwaukee Die Casting Co., Milwaukee, Wis., for name of distributor nearest you.

MILWAUKEE BEARINGS

Get This "Pioneer" Garage Special



Electric Drill
and Valve Grinder

Greatest time and money saver,
as well as money maker, for
your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.

Incorporated Louisville, Ky., U. S. A.
C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

Overcomes Leaky Piston Ring Trouble

Don't rebores the cylinders until you have put a Seney Expansion Spring back of the piston rings and give them a new lease on life. The springs press the worn rings against the cylinder walls, and give permanent, uniform tension. Heat has no effect on them. Order direct giving name, model, year of car.

Seney Expansion Piston Spring
237 Cannon St. Bridgeport, Conn.



Up to
4 in. bore
10c each.

Over
4 in.
bore 15c.

SENEY EXPANSION SPRING

The JOHNSON No. 118 Bench Furnace

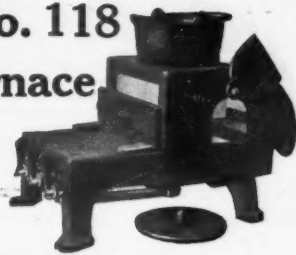
Is a combination for—
Soldering,
Heat-treating,
Metal Melting

Quick acting, high temperature, most durable and efficient Bench Furnace for every bench.

Does Not Require a Blower.

Write for catalog of Gas Appliances.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA



Re-Babbitted Bearing Exchange

We Re-babbitt any Automobile, Truck or Tractor Connecting Rod or Main Bearing with HIGHEST GRADE NICKEL BABBITT and finish them regular Factory sizes. All work guaranteed satisfactory or money refunded in full and transportation paid both ways. All RUSH Orders shipped same day order arrives.

We shipped over 100,000 Bearings last year. Over 5000 satisfied Dealers and Garages will recommend us. Save one-third to one-half your Bearings costs by sending us your work. Ship Parcels Post or Freight. We sell wholesale only.

Fremont Foundry & Bearing Works
Oklahoma City—U. S. A.

DORT

Quality Goes Clear Through

Dort Fours and Sixes from \$870 to \$1465 at Flint

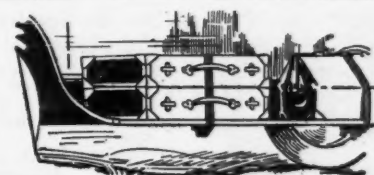
Racing FORDS

Write today for pamphlets and LOW PRICES covering Power-Plus Cylinder Head, Aluminite Racing Pistons and Connecting-Rods, High-Speed Camshafts. Rebuilding ALL MAKES of cars for racing a specialty. Nine years' experience.

GREEN ENGINEERING CO., Dayton, O.



List
\$1.50



Easier to Sell!

Motorists will buy the Hykon Luggage Carrier because it's the most practical carrier they have ever seen—and so inexpensive. Placed under the running board, Holds luggage secure. Durable and easy to use. List \$1.50. Ask your Jobber.

THE HYKON MFG. CO., Alliance, Ohio

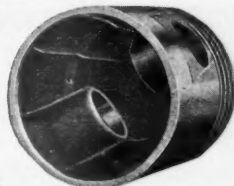
Hykon LUGGAGE CARRIER

24 HOUR SERVICE ON

FOSTER PISTONS

147 Models to Select From

FOSTER-JOHNSON REAMER CO.
1054 Beardsley Ave., ELKHART, IND.



**"The Best-Equipped Shop
Gets the Business"**



Every Ford Owner needs

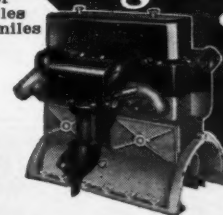
RAJO power, RAJO flexibility, and RAJO economy. All of the advantages of valve-in-head. 3 to 40 miles per hour in 16 seconds. 60 miles per hour from standard Ford models.

Increase Your Profits
with RAJO Sales

It's Easy. RAJO Valve-in-Head pays for itself every season. Easier to install than grinding valves—Use Ford Head Bolts—No cutting of dash—Nothing to move.



**Pays for Itself
in gas saving
alone**



**now
only
\$57¹⁵**

Get our complete proposition. Put a "RAJO window" in your store.
Rajo Motor Co.
1357 Racine St.,
Racine, Wis.



Auxiliary firing-chamber gives it the explosive power of a howitzer. Carburetor must be adjusted LEANER immediately. Overcomes oil, self-cleaning.

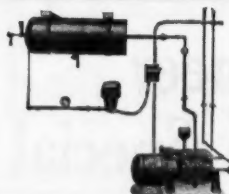
Distributors wanted.

NT

SPARK PLUG

With the Explosive Spark

THE T. N. T. SPARK PLUG CO.
Cleveland, Ohio

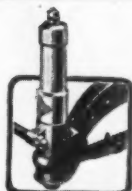


Air Compressor Units

Suitable for Giant Pneumatic Truck Tires
Air Tools and General Garage Purposes

17 cu. ft. Water-cooled Air Compressor for 150 lb. continuous duty. Automatic stop and start. Complete with all necessary control and tank equipment.

ALLIS-CHALMERS MFG. CO.
Milwaukee, Wisconsin



REID AIR SPRINGS

FLOAT THE CAR ON AIR

Promotes smooth, joltless riding by cushioning all road shocks. Positive two-piston action against air pressure and oil. Easily installed and permanent in operation. Big profits for live dealers and distributors.

THE REID AIR SPRING COMPANY
New Haven, Conn.

AXLE SHAFTS and SPRINGS

Also Keys, Key Stock and Nuts for all makes of cars and trucks. Write us about Gilliam Bearings

BUTLER AUTOMOTIVE STEEL COMPANY

Easton, Pa. 101 D Street

Motor Wheel PRODUCTS

Motor Wheel Corporation, Lansing, Michigan

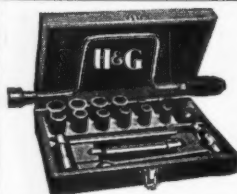


The "UNEEK" and "OTIS" Hose Clamps

are in a class by themselves

OTIS-FLAGG CORPORATION

Main Office and Factory YORK, PENNA.



140 Combinations —all in this ONE set

Everything you need, in one small box, compact, accessible, and a real mechanic's outfit. Sockets will not break. Fully guaranteed. Ask your dealer or write us.

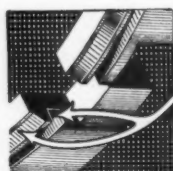
The Eastern Machine Screw Corp.
10-20 Barclay Street, New Haven, Conn.



For information about the Durant and Star Car selling franchises write

DURANT MOTORS, Inc.

560 Jackson Avenue,
Long Island City, N. Y.



See the Beveled Edge and Oil Groove of the Universal One-Piece Piston Ring

Forced Lubrication Prevents Foul Plugs. The beveled top edge and central groove keeps oil from the combustion chamber—reduces carbon. Dealers—Write for the details.

UNIVERSAL MACHINE COMPANY
Baltimore, Maryland



TEST YOUR BATTERIES

by the Chart Method. Something New. Send for free booklet, today.

Allen-Bradley Co.

Electric Controlling Apparatus

281 Greenfield Ave., Milwaukee, Wis.

Show This to Ford Owners

And you can make a ready sale on this system which eliminates all ignition trouble and makes Fords run smoother. List price \$22.50. H & H Generator-Ignition Co., 185 Middle St., Bridgeport, Conn.

The H & H Generator-Ignition Unit for Fords



LINENDOLL EXHAUST HEATER

Warms any car, open or closed. No odor, smoke, dust or noise. Easily installed, operated and cleaned. Sells quickly. Write for our attractive trade proposition.

THE NORWALK AUTO PARTS COMPANY
Norwalk, Ohio

WEIDENHOFF PRODUCTS

Electrical Testing Equipment

Universal Test Benches, Growlers, Magnetizers, etc. Write today for Bulletin M-18

4358 W. Roosevelt Rd., Chicago, Ill., U. S. A.



STEVENS TOOLS

SPEED UP



OVER 50 WONDERFUL SHORT CUTS IN NEW CATALOG T-105

ASK FOR IT

STEVENS & COMPANY
175 BROADWAY, NEW YORK

THERE are two factors that determine the value of a publication as an advertising medium.

Editorial excellence will indicate its influence with its readers.

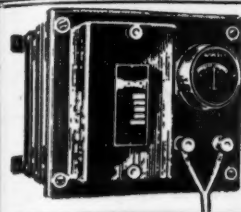
Membership in the Audit Bureau of Circulations indicates its business ethics and methods.

The first shows whether the paper is worth reading.

The second shows how many people read it.

In both the advertiser is vitally interested.

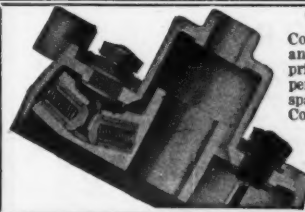
MOTOR AGE invites the closest scrutiny. Its A. B. C. report is accessible to advertisers.



Automobile and Radio batteries charged for a nickel. Ten million car owners and five million radio fans are prospects for

THE HOMCHARGER

BIG PROFITS. WRITE NOW.
The Automatic Electrical Devices Co.
122 West 3rd St. Cincinnati, Ohio



THE DOUBLE CONTACT TIMER
Combines the "wipe" and "roll" contact principles. Gives full, perfectly synchronized spark at all speeds. Contacts are positive and unfailing. A wonderful dealer proposition. Write
E. D. Hodge Tool & Mfg. Co.,
Watertown, N. Y.

Twin Timer
FOR FORD CARS TRUCKS & TRACTORS

Let us send you our FREE Catalogue on

Huetter's Fly-Wheel Gear Bands

Huetter Machine & Tool Co.
545 Kentucky Ave. Indianapolis, Ind.



Just a Little Bit Ahead

—with double pole automatic switch; maximum safety and efficiency assured.

JAS. CLARK, JR., ELECTRIC CO., Inc., LOUISVILLE, KY.



Bosch

The Genuine, Original Bosch of world-wide fame and world-wide distribution means Robert Bosch only. Robert Bosch Magneto Co., Inc.
The Genuine, Original Bosch
Otto Heins, Pres., 123 West 64th St., New York

THE GRAND PRIX CAR

DUESENBERG Original Straight Eight

Duesenberg Automobile & Motors Co., Inc., Indianapolis

GENERAL ASBESTOS & RUBBER COMPANY



GARCO ASBESTOS PRODUCTS

Branches
New York Chicago Pittsburgh
Main Office and Factories: Charleston, S. C.



Air Compressors; Gasoline and Oil Storage Systems; Heavy Metal Storage Tanks; Oil Burning Systems; Furnaces and Forges; Oil Filtration Systems; Water Softening Systems.

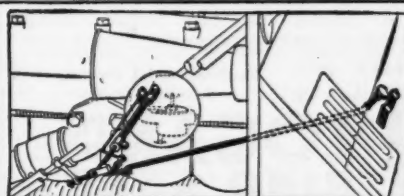
WAYNE TANK & PUMP COMPANY,
706 Canal Street, Fort Wayne, Ind.

Wayne



Over the top on all four
with a
Rush Timer
FOR FORDS

W. S. Rush & Co., Mfrs., 112 N. Daly St., Los Angeles, Calif.
S. S. McClelland Co., Eastern Distributor, 1926 Broadway, N. Y. City
Rush Brake Shoes—Transmission Band Oiler & Cooler



THE GREEN LINE FOOT ACCELERATOR
Quickly installed, no bolts to remove. Action is easy and positive. Works free from hand throttle. Floor boards can be removed without disturbing Accelerator.
Write for full particulars.
Price \$1.25
Green Manufacturing Co.,
506 Second St., Milwaukee, Wis.

KISSEL

The Custom Built Car



The Aristocrats of Motordom

7 Models—Open and Closed

Distributors in principal cities. Open territory now being closed.

Kissel Motor Car Co.
Hartford, Wis.

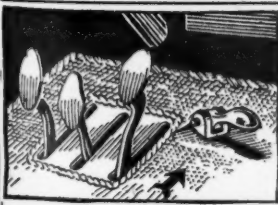
VULCAN

The Replacement Spring

JENKINS VULCAN SPRING CO.

Factory: RICHMOND, INDIANA

BRANCHES: Boston, Mass., 819 Boylston St.; Dallas, Tex., 2216-18 Commerce St.; St. Louis, Mo., Main and Cedar Sts.; San Francisco, Cal., 1085 Polk St.



Williams Accelerator
for FORD CARS

Comfortable to operate.
The pedal may be swung to any position desired.

WILLIAMS BROS. AIRCRAFT CORP.
San Francisco

WEL-EVER OIL CONTROL PISTON RINGS

Write for interesting circular on oil pumping and details about this fast selling piston ring.

THE WELEVER PISTON RING CO.

1713-15 Canton St.

Toledo, Ohio

PERFECTION GEAR COMPANY

PERFECTION

SILENT DURABLE DEPENDABLE

Silent Timing GEARS

1475 Michigan Ave. CHICAGO

WORLD'S STANDARD REPLACEMENT

Empire

Tires and Tubes

"Wear Longest"

THE NEW EMPIRE DISTRIBUTION PLAN

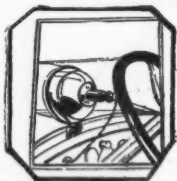
enables dealers to make extra profits on these well known super-standard casings and tubes.

Empire Tire & Rubber Corp.

TRENTON NEW JERSEY

GET ACQUAINTED WITH GASKO CEMENT

It's Better Than Shellac for Motor Gaskets
Send 25c in stamps for Trial Tube—Today.
VAN SICKLE MFG. CO., Lincoln, Nebr.



Sells Wherever Shown INSHIELD SPOTLIGHT

Fits snugly against windshield. No glass to cut. Easily and quickly attached. Can be pointed to any angle. Beautifully finished. Easy to sell. Jobbers, dealers, write for details.

MADE ONLY BY
The Thal & Bitter Machine Co., Toledo, Ohio

WAYNE REAMER



Double duty adjustable reamers. Set of seven, \$40.
Made by TOOL-MAKERS. Circular.
WAYNE TOOL MFG. CO.
Waynesboro, Pa.

WITH
DETACHABLE
PILOT

BRUNNER AIR COMPRESSORS

GOOD FOR
"TWENTY YEARS AT HARD LABOR"

BRUNNER MFG. CO.,

Utica, N. Y.



Be the local Logan Man — Let us show you how easy and how profitable it is to install Logan Ring Gears.
Kauffman Metal Products Co.
Bellefontaine, Ohio

LOGAN FLY WHEEL RING GEARS



The COURIER Six

Nine body types,
from \$1,195 to \$2,165

THE COURIER MOTORS COMPANY
SANDUSKY, OHIO



Kelso

BRAKE LININGS and CLUTCH FACINGS

Always used where safety and service are the first and only consideration.

KELSO M'FG CO.,

TRENTON, N. J.



WEAVER GARAGE AND SHOP EQUIPMENT

WEAVER
MANUFACTURING
COMPANY
SPRINGFIELD
ILLINOIS
U.S.A.

Send for Catalog

WICACO Twin Cut Piston Ring—

With the Wandering
Oil Groove

[pronounced
WICK-A-CO]

WICACO

SCREW & MACHINE WORKS, INC., 4801 Stenton Ave., Phila., Pa.



GATES VULCO

Fan Belts and Radiator Hose

"Leaders in the Industry"

RED DEVIL

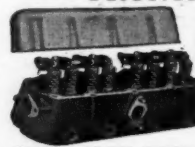
SELF-ALIGNING BURNISHING MACHINE

Makes it possible to fit over-size pistons without removing engine from the car when the variations do not exceed 5/1000 of an inch. Cylinders slightly tapered, out of round, or with shoulders worn by pistons or rings may be made round, straight and true. Price \$25. 12 ounce can Red Devil Compound, \$1.50. Write for complete details.

MID-WEST MFG. CO. Minneapolis, Minn.



FRONTENAC CYLINDER HEADS and FRONTY-FORDS

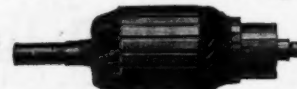


The remarkable showing of the Fronty-Ford in the 500-Mile Race at Indianapolis May 30 was due solely to the performance of the Frontenac Cylinder Head. This Head is adapted for use on your Ford car by its designer and builder, Arthur Chevrolet. Write for FREE Catalog. Book "How to Build a Fronty-Ford," \$2.00; free with orders of \$50.00 or more.

CHEVROLET BROS. MFG. CO., 410 W. 10th St., INDIANAPOLIS

Send Us Your Armature Repair Work

FORD
ARMATURES
REWOUND
\$2.00



MOST ANY
TWO UNIT
GENERATOR
ARMATURE
\$5.00

ALL WORK GUARANTEED—WRITE FOR PRICE LIST
U. S. AUTO SUPPLY CO., 3845-49 S. WABASH AVE., CHICAGO

McKAY TIRE CHAINS

McK

UNITED STATES CHAIN
& FORGING CO.
Pittsburgh, Pa.



Goodrich MOTOR TESTING Valve

Small
Size
\$3.

(Replacing Old Style Cut-out)
THE GOODRICH-LENHART MFG. CO.
Hamburg, Pa.

BOWSER

ESTABLISHED 1885

ACCURATE MEASURING PUMPS

S. F. Bowser & Co., Inc.

Home Plant, Fort Wayne, Indiana

HIGH SPEED HOIST
MEANS HIGH SPEED PRODUCTION

WRIGHT
LISBON, OHIO, U. S. A.

But Be Sure It's **WRIGHT**

STOPS GUESSING
Indicates definitely direction driver intends to turn. Signals at both front and rear of open or closed cars. Meets requirements of all State laws. Attractive — Durable — Effective. Dealers — Jobbers, write for details and territory.

Traf-i-kop
SIGNALS RIGHT, LEFT, GO OR STOP

The Motor Products Co.
Norwalk, Ohio

R & V Knight
SIX
"EVERLASTING PERFORMANCE"
Engine Sealed and Guaranteed for 2 Years

R & V MOTOR COMPANY East Moline, Ill.

IT'S EASY TO SELL
"The only oil ring with a mileage guarantee"
"Sav-Oil" is stamped on bottom of every ring

The Sav-Oil Ring Mfg. Co.
1037 S. Figueroa St., Los Angeles

SPENCER

The Spencer Lock Tilting Steering Wheel first adds comfort in the driver's seat—then protects the car from theft. And the insurance it saves pays back the purchase price. Ask your jobber for details. Made for Ford, Dodge, Overland, Chevrolet 490 and Superior, Maxwell, Star and Gray Cars.

Should Be On Every Car You Sell

The Spencer Mfg. Co. Spencer Ohio

"BEACON SYSTEM"
Electric or hand operated. Five or ten-gallon full visible pumps. Ten models visible pumps, twenty models roadway and oil pumps.

Write for Catalog No. 15.

BEACON VISIBLE PUMP CO.
722 WEST BRECKINRIDGE ST. LOUISVILLE, KENTUCKY

JARVIS WATER INDICATOR
Prevents trouble due to lack of water. Warns of other danger before it grows serious. When the water gets low so does the red spot. When the water boils, the red spot jumps. Only one moving part. Moderate price, large profit, easily sold. See the Jarvis Water Indicator on the new Maxwell Sport Model. WRITE FOR PROPOSITION.

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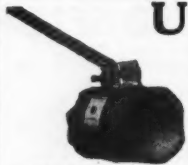


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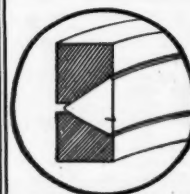
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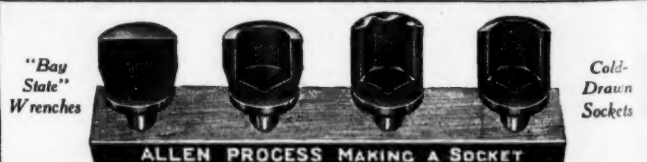


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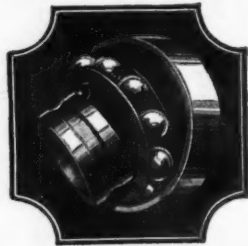
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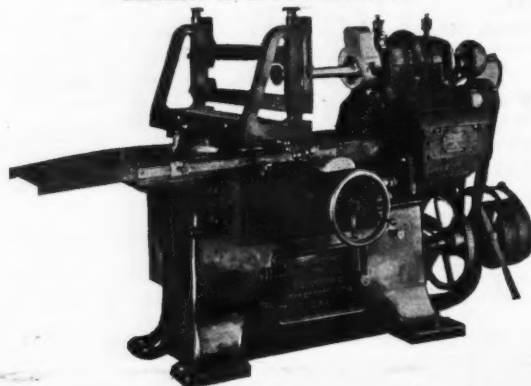
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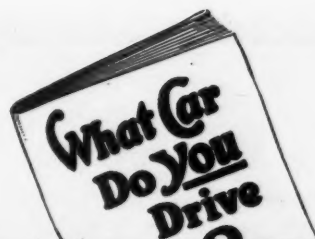
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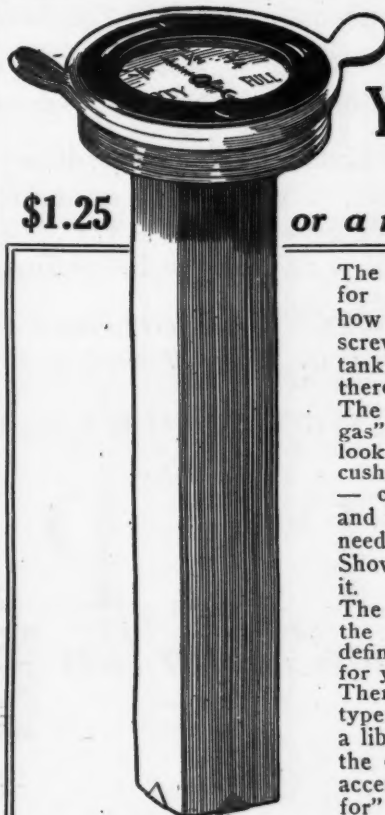
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1/2-inch Portable Electric Heavy Duty Drill.....	\$100	\$10	\$ 90
5/8-inch Portable Electric Drill	\$105	\$10	\$ 95
9/16-inch Portable Electric Drill	\$105	\$10	\$ 95
7/8-inch Portable Electric Drill	\$125	\$15	\$110
No. 1 Electric Screwdriver.....	\$ 65	\$17	\$ 48
No. 2 Electric Screwdriver.....	\$ 80	\$12	\$ 68

Other Black & Decker Electric Tools were reduced in price earlier in the year as follows:

	Old Price	Reduction	NEW PRICE
1/4-inch Portable Electric Drill	\$39	\$11	\$28
1/2-inch Special Port. Elec. Drill	\$85	\$17	\$68
Bench Drill Stand	\$33	\$ 5	\$28
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Forecast in 1923
THE CHANDLER MOTOR

The MOTOR that spells BIG PROFITS

Your Chance to MAKE MONEY

A New Dealer Contract that insures PERMANENCE OF BUSINESS

The Dealer Sign and the Dollar Sign

A PROFIT OPPORTUNITY for progressive dealers

NEW CHANDLER SIX

IF YOU are located in open Chandler territory, you have an exceptional opportunity—that of acquiring the Chandler account at the most advantageous time in its history.

The Chandler has always stood out as one of the really desirable accounts.

But at no time has it offered as much to able dealers as it does today.

Last January we announced the

Pikes Peak Motor

And its phenomenal performance powers have enabled almost every dealer, large and small, to break all previous records of sales, deliveries, and PROFITS!

If you are now plugging away with a line that is not giving you the profits you know you should have—this is your big chance, not only for immediate profits, but for future expansion. For our new dealer contract is being written without a termination date. You'll get immediate action if you write today!

THE CHANDLER MOTOR CAR CO., CLEVELAND
Export Dept., 1819 Broadway, New York City. Cable Address "CHANMOTOR"

CHANDLER